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ABSTRACT

This report provides an overview of the legislative and administrative context of Vocational Education and profiles Vocational Education nationally, statewide, and at Contra Costa Community College District (CCCCD). Certain national trends, economic trends, and labor market trends have created implications for vocational and technical education in California. For example, the volume of the educational opportunities must increase greatly to meet the demands created by California's rapidly increasing population. Therefore, it is necessary that California community colleges create a kind of vocational and technical education that is technically sound and up-to-date as well as academically vigorous and culturally inclusive. The document discusses the five priorities of the California State Plan, which include performance accountability, curriculum development and improvement, professional development, student support structures, and partnership development. The document also addresses the recommendations made by the California's Field Review Committee on the development of vocational education in many areas including linkage and partnerships, student support services, student organizations, and funding. The document also addresses California's three components of nontraditional indicators, which address programs leading to employment in nontraditional occupations and the relationship between participation rates and completion rates. (Contains 43 tables, 16 figures, and 81 references.) (MZ)

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VOCATIONAL EDUCATION REPORT

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Executive Summary

Executive Summary

This report is the third and final mission specific topics scheduled for the 2001-02 agenda of the Governing Board. It provides an overview of the legislative and administrative context of Vocational Education and profiles Vocational Education nationally, statewide, and at Contra Costa Community College District (CCCCD).

Overview

National Perspective

Historically, the purpose of Voc. Ed. was to prepare students for entry-level jobs in occupations requiring less than a baccalaureate degree. Over the last 15 years, however, the purpose of Voc. Ed. has shifted toward broader and higher-level preparation that assists learners to develop academic, vocational, and technical skills to meet employer needs for critical thinking, personal responsibility, and social skills.

Voc. Ed. policy encourages high school students to continue their studies at the postsecondary level, and two-year postsecondary students to pursue four-year credentials.

Increased global competition has spurred some of the larger U.S. businesses to create "high-performance workplaces," relying on flexible and decentralized work practices and multi-skilled workers; to engage in performance benchmarking; and to undertake reengineering. The 1994 School-to-Work Opportunities Act approved to bring employer involvement in school-to-work partnerships and wider implementation of work-based learning, including job shadowing, mentoring, internships, and apprenticeships. A majority of employers with employees who participated in work-related learning reported that these employees were superior to comparable new hires in terms of productivity and attitude.

Between 1992 and 1996, the total number of adults who held academic associate's degrees increased by approximately 1 million people. Among all sub-baccalaureate students, about one-half majored in a vocational program area in 1996: the proportion decreased from 54% to 49% from 1990 to 1996. There was a 17.9% increase (67% to 79%) between 1990 and 1996, however, in the proportion of postsecondary vocational students being served by community colleges, with a corresponding decrease at private proprietary institutions.

Voc. Ed. students were more likely to be older, to have family responsibilities, to receive financial aid, to have a previous postsecondary degree or certificate, and to report higher postsecondary grade-point averages (GPAs) than their academic counterparts. These students with vocational majors also tended to have parents with lower educational attainment.

Business, health, and technical fields (the latter including engineering/science technologies, computers/data processing, and protective services) accounted for large numbers of vocational students' majors. Among sub-baccalaureate students, gender gaps persisted in the fields of business, health, and "other vocational" fields (where women predominated), as well as in trade and industry, protective services, computers/data processing, and engineering/science technologies (where men predominated). A particularly large gap between the participation of men and women occurred in 1996 in engineering/science

technology, a field in which 12% of male students and only 2% of female students declared a major.

Among the group of students who first began their postsecondary studies in 1989-90, the majority of both academic and vocational majors completed some type of degree or certificate within four years. Research has shown that positive employment and earnings outcomes accrue to participants in vocational education who concentrate their coursework in a vocational field of study in high school, who complete a postsecondary vocational program and obtain a certificate or degree, and who obtain a job in a field related to their vocational education.

Economic Trends

The United States is moving to an economy that provides mostly services and information. Changes in the type and level of education and training received by Voc. Ed. students appear to reflect this shift.

In reviewing the trend toward a service-based economy, it is necessary to introduce four key terms: **service-producing industries** (e.g., transportation, utilities, wholesale/retail trade, FIRE, public administration); **goods-producing industries** (e.g., agriculture, mining, construction, manufacturing); **service-producing occupations** (e.g., managerial/professional specialties, support technicians, sales/administrative support) and **goods-producing occupations** (e.g., farming, fishing, forestry, crafts, repair operators, laborers). In 1997, the broader "service-producing industries" classification covered 74.4 % of total employment in the U.S., and service-producing occupations covered 72.2% of total employment. These findings clearly show the shift toward a service-based economy. The Bureau of Labor Statistics projects that the service-producing sector will create virtually all of the new jobs between 1996 and 2006, with almost two-thirds of these jobs in the services industry. (Figure 1, Tables 1a and 1b)

Major industrialized economies are becoming "knowledge-based," where the creation, distribution, and use of information and knowledge-including both technology and human capital-are becoming increasingly important. According to some calculations, more than half of the total gross domestic product in the major industrialized economies is now knowledge-based, including industries such as telecommunications, computers, software, pharmaceuticals, education, and television. High-technology industries have almost doubled their share of manufacturing output over the past two decades and knowledge-intensive services are growing even faster. By one reckoning, "knowledge workers," from brain surgeons to journalists, account for eight out of every ten new jobs.

Labor Market Trends

The Department of Labor's Bureau of Labor Statistics (BLS) indicate that employment in professional specialty occupations is projected to increase the fastest and add the most jobs between 1996 and 2006. The group with the second fastest growth rate is projected to be technicians and related support occupations, although this group is small and is not expected to add a large number of jobs. The next fastest growing group is service occupations, which together with professional specialty occupations are projected to add nearly half of all new jobs from 1996 and 2006. (Table 2)

Among detailed occupations, the ten occupations with the **highest projected growth rates** are all service-producing occupations, and they can be classified in either the computer technology or health fields. Between 1996 and 2006, these occupations are projected to grow from 69% to 117%, while the average growth rate for all occupations is projected to be 14% over the same period. (Table 3a)

The ten detailed occupations with the **largest projected increases in number** of jobs are projected to make up 16% of total employment by 2006. Only systems analysts and home health aides are included on **both** the top ten lists of fastest growing and largest growing areas. Nine of the ten occupations with the largest projected numeric increases will grow at average or above-average rates. (Table 36)

Both rates of employment and labor force participation rise with educational attainment. In 1996, more than half or 56% of people lacking a high school education were not in the labor force, compared with 27% of those with at least some college education. Additionally, in 1996, median weekly earnings for fulltime workers generally increased as the education and training requirements of an occupation increased. For example, while workers in jobs requiring no more than short-term on-the-job training earned $337 per week, on average, those with an associate's degree earned almost twice as much ($639). Of interest to the CCCCD community, postsecondary students who complete a vocational program and obtain a degree or certificate have been shown to have better outcomes than their counterparts who do not complete their programs. (Figure 2, Tables 4-6)

The American Association of Community Colleges (AACC) study on "hot programs" found the following:

1. Starting salaries for hot program graduates increased by 21% between 1997 and 2000.
2. 75% of students in the credit hot programs were enrolled in either computer technology or allied health.
3. Dental hygiene has the highest reported salary increase, with a 32% jump since 1997.
4. 65% of respondents offering training for IT vendor certification offer the training on a for-credit basis.
5. 9% of new credit courses/programs were added in response to a demand for workers in skilled trades such as construction, welding, and carpentry.
6. Between 1998 and 2008, jobs requiring an associate degree will increase by 31.2%, the largest percentage increase among all educational levels.

These returns are consistent with the national trends reported by NCES. (Tables 3-17)

Vocational Education And The California Community College System

Demographic and Economic Context

California's economy is the fifth largest in the world, and its regions vary considerably in industrial composition, population, and economic status. State planning for vocational and

technical education takes these important differences into account. The unemployment rate and construction growth in major metropolitan areas in the spring of 1999 illustrates the range of economic conditions around the state. Large portions of the state, including Sacramento, San Diego, Riverside, and San Bernardino counties, enjoyed essentially full employment (less than 5% unemployment), while the highest-employment county in the Central Valley had a 12% unemployment rate. Another indicator of economic condition is construction growth. Here too the regions reported highly variable results. Some counties reported a 20% to 25% decline in residential construction, while others were engaged in an unprecedented building boom. In sum, to meet the educational and occupational training needs of California in general and state counties in particular, the state plan for vocational and technical education must take into account regional differences in industry needs, economic structure, and availability of training resources.

Statewide Employment Growth by Industry, 1996-2006

The following are projected employment changes between 1996 and 2006 prepared by California's Employment Development Department (EDD) for major industries, for occupational categories, and for segments of those industries showing the largest absolute changes in employment. Overall, EDD projects an increase in employment from 1996 to 2006 of more than three million, a 25% rise. Nearly all industries, with a few minor exceptions, are expected to gain employees.

Implications for Vocational and Technical Education in California

1. The sheer volume of educational opportunities must increase dramatically to meet the demand created by California's burgeoning population.
2. Changes in work organizations and technology will make frontline workers responsible for operational improvement, problem solving, and quality control.
3. In California all students-not just a select group bound for baccalaureate degrees-should gain advanced literacy and mathematics skills as well as sophisticated technical competencies and an ability to understand the interdependency among all aspects of an industry.
4. For the entire California education system, improvement of vocational and technical education is interrelated with other statewide reforms, including clearer high-level learning goals for elementary and middle school students, higher secondary graduation and subject matter standards, additions to the University of California and California State University entry requirements, efforts to improve gender equity, services to disadvantaged students, service-learning, and other secondary and postsecondary initiatives.
5. Beyond preparation for immediate employment, vocational and technical education must anticipate that today's students will need the capacity based on a solid grasp of academic fundamentals in language, mathematics, and science to embrace future changes no one can foresee.
6. California's extraordinary cultural diversity imposes additional responsibilities on vocational and technical education.

7. Responding to these challenges and opportunities requires a kind of vocational and technical education that is technically sound and up-to-date as well as academically rigorous and culturally inclusive.

State Plan and Priorities

California's Field Review Committee (CFRC), appointed by the Chancellor of California Community Colleges and the Superintendent of Education, was charged with providing advice on the development of the State Plan for Voc. Ed. CFRC was asked to pay particular attention to the new emphases in the Perkins Act on accountability and to assist the state in determining the issues to which the state could most appropriately turn its attention. Its recommendations are summarized below by the categories that emerged: (Full text is provided on pages 28-29 of this report.)

Accountability:

Spell out standards, performance criteria, definitions of eligible students and courses, sensible consequences, and data collection systems.

Maximize the use of accountability information to improve local programs and enhance student performance.

Curriculum Development:

Emphasize the development and continuous improvement of integrated curriculum based on up-to-date industry standards (developed in partnership with industry), statewide tests, SCANs, and other generic skills, including education for a global economy.

Professional Development:

Create a sustainable, systematic, sequential, and comprehensive professional development program for vocational and technical educators.

Linkages and Partnerships:

Create statewide industry-based advisory committees serving as advisers to the Chancellor's Office of the Community Colleges and the California Department of Education for all secondary and postsecondary vocational and technical education programs.

Student Support Services:

Help counselors, librarians, and other student and instructional support personnel obtain accurate, up-to-date information about job markets, skills, and requirements.

Student Organizations:

Continue support for vocational student organizations. Better integrate student-sponsored activities across student organizations.

Funding:

As a condition of funding, ensure that Perkins Act dollars are used to improve student performance.

Guarantee that recipients of scarce vocational and technical education funds have made a sufficient local effort to provide high-quality vocational and technical education programs. Promote the exploration of matching requirements or other mechanisms to accomplish this goal.

Restructure multiple funding streams in order to eliminate redundant and sometimes conflicting requirements and to maximize resources from various funding sources.

Administrative and State Leadership by the Chancellor's Office

The State Plan recommended by CFRC was approved by The Board of Governors of the California Community Colleges, the California State Department, and the U.S. Department of Education. The State Plan addresses the requirements of the Carl D. Perkins Vocational and Technical Education Act (VTEA) of 1998 and is viewed as a first step toward what needs to be done. It is hoped that the State Plan will open up discussions of what Vocational Education should be in California and how it should fit into the larger educational and economic context.

Priorities:

The following state leadership priorities and specific activities are to be implemented and/or completed during the period of the State Plan:

1. Performance Accountability: Determining performance standards, indicators, goals and maximizing the utility of accountability information to improve student performance.
2. Curriculum Development and Improvement: Reviewing, upgrading, and improving content and delivery of curriculum and developing new courses/programs that satisfy the needs of changing and emerging occupations.
3. Professional Development: Ensuring that faculties are current with industry standards and have the resources to teach to industry standards.
4. Student Support Structures: Increasing access to and success in vocational and technical education for all students who elect to enroll in vocational and technical education programs, particularly members of special populations.
5. Partnership Development: Improving linkages, cooperation, and collaboration among a variety of partners to produce responsive solutions to workforce development needs.

Accountability Measures:

Higher education institutions will collect and report data by vocational program area. Data will be aggregated across vocational program areas for federal reporting purposes; however, the state will provide program area information to individual institutions to assist them in conducting internal program improvement efforts. Data will also be collected and reported separately on students participating in noncredit programs and on students participating in Tech-Prep programs. The areas for which data will be collected are:

- Academic and Vocational and Technical Skill Proficiencies
- Completion Rate
- Placement in Postsecondary Education, Employment, or the Military

- Retention in Employment
- Nontraditional Participation and Completion

Level of Performance: The state will focus on three components of the nontraditional indicator:

Component 1: For programs leading to employment in nontraditional occupations, the percentage of the nontraditional gender in enrollments will be at least 26.46%. District and college levels will be set such that programs and special populations within program areas will be identified that are below this rate.

Component 2: For programs leading to employment in nontraditional occupations, the percentage of the nontraditional gender in completions will be at least 27.54%. District and college levels will be set such that programs and special populations within program areas will be identified that are below this rates.

Component 3: The purpose of this component is to examine the relationship between participation and completion. Completion rates of programs identified as nontraditional should be similar to or higher than the participation rates in those programs. Completion rates equal to or higher than participation rates may suggest that no artificial barriers exist within the program structure. District and college levels will be set such that programs and special populations within program areas will be identified that are below these rates.

County Workforce: A Snapshot

Industry Employment

Contra Costa County is expected to increase its job growth 37.2% over its 2000 baseline by 2005. This compares favorably with San Francisco, Alameda, and Napa, but is less than that forecasted for Solano County which shows a 52% increase over its relatively small 2000 job base. (Figure 5)

Job growth is one measure of economic health. From 1996 to 2000, Contra Costa County's wage and salary employment added 43,000 jobs, a cumulative growth of 14.4%. In 2000, payroll employment grew by 14,100 jobs. The largest concentration of new jobs was in the services industry, which increased by 7,000 or 6.6%. (Figure 6)

In 2000, services, retail trade, and government sectors dominated Contra Costa employment accounting for 65.4% (222,818) of the total employment (370,700) in the county. Other industries included construction, manufacturing, wholesale trade, transportation and public utilities, and agriculture. (Figure 7)

Labor Force

Each year for the 1996-2000 period, Contra Costa County sustained growth in the civilian labor force , recording a high 3.1% in the year 2000. This surpassed the state's rate of growth, 3.0%, for the same year. Over this period, Contra Costa County's labor force grew from 459,500 in 1996 to 505,100 in 2000, a cumulative increase of 45,600 or 9.9% . This compares to a cumulative growth of 10.2% for the state and 8.7% for neighboring Alameda County. Since 1996, unemployment rates are lower for Contra Costa and neighboring Alameda County than for the state, indicative of the employment opportunities in these areas. From 1996 to 2000, Contra Costa County's annual average unemployment rate dropped by 2.2%, from a high of 4.0% in 1996 to 2.7 in 2000. The greatest year-to-year decline occurred in 1997 when the rate fell by 0.8%. For 2000, the annual average unemployment rate was down by 0.3% from the previous year. California and Alameda experienced a similar pattern of decline in unemployment. (Figures 8 and 9)

The Association of Bay Area Governments (ABAG) forecasts that there will be more employed residents than there are jobs in the county by as early as 2010. This suggests that many residents will be working outside of the county. This trend means that there will be a continuation of or an increase of congestion in the usual traffic corridors. ABAG forecasts that the greatest job growth in absolute terms from 2000 to 2010 will occur in Concord, Walnut Creek, and San Ramon, and the largest job growth in percentage terms will occur in eastern part of the county. (Figure 10, Tables 18-20)

Many of the occupations showing growth in absolute or percentage terms will require various levels of on-the-job training, an AA/AS or BA/BS degree. (Tables 22-26)

Vision of Business Community and Implications for Partnerships with CCCCD

In May 2000, the Contra Costa Economic Partnership (CCEP) and the Contra Costa Council (CCC) joined forces with other county business organizations to hold an Education Forum. The topic of this Forum was "Creating an Educated Workforce for our Knowledge-Based Economy". This summit brought together business and education leaders to discuss effective strategies for teamwork with the focus on preparing students for high-wage, high-skilled, 21st-Century jobs. The outcomes of this conference were the guiding force for the development of key education initiatives that are encompassed in the following Executive Summary of this Forum.

It is the intent of the two organizations (CCEP and CCC) to play an intermediary role between business and education for the development and support of collaborative strategies which include a shared vision, strong leadership, data-driven decision-making, and professional development components. Their recommended goals below will be the education focus of CCEP and the CCC from 2000 through 2003.

- Goal 1: Support the integration of technology into the education system to achieve high academic standards using real world application models.
- Goal 2: Expose educators to other fields of work through job shadowing, internships, career days, and other workplace-based experiences.
- Goal 3: Support learning strategies (e.g., career academies, smaller learning communities, work-based learning) that provide a more personalized school experience and integrate academic studies with real world applications.
- Goal 4. Recognize programs, organizations and individuals that exemplify the Guiding Principles. Objectives: Establish an annual awards program for this purpose.

Vocational Education Programs, Assessment, and Vision at CCCCD

CCCCD has institutional effectiveness indicators to gauge its progress along key educational dimensions. Part of CCCCD's Institutional Effectiveness 2000 Report regard the performance of students receiving Voc. Ed. instruction and the progress of CCCCD in meeting its Partnership for Excellence (PFE) goals in this area. These evaluations build on data and analyses from the State Chancellor's Office that permit comparisons across select community college district. Relevant findings are presented in this report for each indicator or PFE goal to the extent possible. Several other sources of program assessment data are also included: SB 645 Follow-Up Assessment of Voc. Ed. Participants, VTEA 2001-02 Core Indicators of Performance of Voc. Ed. Participants, and CC Benefits Inc. Study Highlights.

Demographics of Vocational Education Students and Course Profile

This spring semester, 25,153 students enrolled in 914 sections offering Voc. Ed. instruction: 84% in Introductory courses, 13% in Advanced-Level courses, and 3% in Apprenticeship courses. The reasons for a substantial drop in enrollment between each level of instruction are not clear, and an inquiry is needed to identify the factors that may contribute to this. (Table 27)

The race/ethnicity of students for Introductory and Advanced-Level courses mirrors that of students in general. For apprenticeship courses there are substantially fewer Asians and Blacks. The proportion of minority students participating in Voc. Ed. is equal to or greater than their representation in the county population. (Table 27)

Institutional Effectiveness Indicators

This analysis covered the three types of Voc. Ed. courses that are available at CCCCD. The State MIS and CCCCD use the following designations to indicate the extent to which each type of course is "occupational" and to help identify course sequence in occupational programs:

Apprenticeship (Code A): These courses are designed for indentured apprentices only and must have the approval of the State of California, Department of Industrial Relations, Division of Apprenticeship Standards. Some examples of apprenticeship courses are: Carpentry, Plumbing and Machine Tool.

Advanced (Code B): These courses are those taken by students in the advanced stages of their occupational programs. A "B" course is offered in one specific occupational area only and clearly labels its taker as a major in this area.

Introductory (Code C): These courses are clearly occupational but not advanced. Courses will generally be taken by students in the middle stages of their programs and should be of difficulty level sufficient to detract "drop-ins."

For 1998-99 and 1999-00, The successful course completion rates (i.e., a grade of "C" or better) of Voc. Ed. courses were found to be relatively higher than for Transfer and Basic Skills courses. This finding is to be expected. Presumably, the success rate of Voc. Ed. courses is substantially higher than that for Basic Skills because students in the latter are not as academically prepared. The fact that they are slightly higher than that for transfer courses could be due to a number of variables, such as maturity of students enrolled, experience level of students, e.g. a number of students in Voc. Ed. are upgrading skills and therefore have job experience to reinforce learning. (Figure 10)

Over the last five years, from 1996-97 to 2000-01, the average **course retention rates** for CCCCD show relatively higher performance levels over 1996-97 for all three Voc. Ed. instructional levels (Apprenticeship, Advanced, Introductory). These rates compare favorably with the average such rates of other institutional benchmarks: the Bay Area's ten community college districts, multi-college community college districts in the state, and the California Community College System. (Tables 30 and 31)

Over the last five years, from 1996-97 to 2000-01, the average **successful course completion rates** for CCCCD show relatively higher performance levels over 1996-97 for all three Voc. Ed. instructional levels. This is impressive given the reported high course retention rates. Indeed, these findings show that CCCCD's performance in this area was relatively higher than those of said institutional benchmarks in all three Voc. Ed. levels, with the Advanced Level showing the greatest performance difference. (Tables 32 and 33)

Partnership for Excellence Goals

Goals Three and Four of the PFE initiative regards workforce development stipulating an increase in the percent and number of successfully completed Voc. Ed. courses in general and for different levels of Voc. Ed. instructional. (Tables 34 and 35)

An evaluation of progress toward the PFE goals found that CCCCD colleges have a relatively lower successful course completion rate for all Voc. Ed. courses than what was the case in 1995-96. Their performance in this area is comparable to that of Bay 10 districts. Other multi-colleges districts elsewhere and the system as a whole performed better on this measure than did CCCCD. For each type of Voc. Ed. course, the averages of successfully completed courses at each college during the 1999-00 and 2000-01 periods were less than the 1997-98 benchmark performance levels, with one exception. The colleges will not reach their 2005-06 targets at their current rate of progress in each Voc. Ed. area. Further study is needed to identify reasons and potential intervention. (Tables 36-38)

SB 645 Follow-Up Assessment of Vocational Education Participants

These data come from the States Performance-Based Accountability (PBA) System for California Workforce Preparation programs that are tied to SB 645 legislation.

Demographics of Program Participants: The number of program participants in Voc. Ed. programs appears to be increasing substantially so. However, over 80% of participants in the 96/97 and 97/98 cohort groups did not complete their programs. These "Leavers" tend to be older than "Completers". Further study is needed to identify cause and potential intervention. An inquiry is needed to identify these factors and the steps that may be taken to ensure program completion. It is possible that older students leave because they tend to have job skills that are highly valued in the market place and tend to be more employable. Older Leavers would therefore have shorter-term objectives for participating in Voc. Ed. programs (e.g., skill upgrades vs. attainment of an award). There is a higher concentration of female than male amongst Completers and Leavers. A higher percent of Asians complete rather than leave their programs; alternately, Whites tend to leave rather than complete their programs. Amongst Blacks and Hispanics a comparable percent tend to complete or leave their programs. The proportion of minorities participating in Voc. Ed. programs is larger than their representation in the county population. (Table 39)

Statewide, the most popular training programs that students tend to complete are those for nursing, criminal justice/law enforcement administration, and business/general. It should be noted that "leavers" or "skills upgrade" students may have taken 12-18 units. Whether students complete their programs or leave before receiving a certificate or degree, of course, depends on a host of factors, including the availability of attractive job options and the student's need to cover his or her living expenses. (Table 40)

The difference between pre- and post-program income of participants gives the most dramatic evidence of program impact. The percent of program Leavers and Completers who are employed one year after attendance has come to be comparable. However, the employment rates of the Completers over a three-year period suggest that with time the value of having completed a Voc.

Ed. program becomes more apparent: Completers continue to be employed at a relatively higher rate than Leavers (81.3% vs. 76.3%). The fact that Leavers are employed at a high rate may reflect the state's robust economy for the time period assessed, especially towards the end of the 90's. While the employment rates for Completers and Leavers may be comparable during the first year after attendance, the increase in the median earnings of these groups one year after participating in their Voc. Ed. programs is much more pronounced. Available data shows that for those whose earnings were equal to or greater than the annual minimum wage before participation, the percent increase in the median salary relative to wages before program participation was generally greater for Completers than Leavers (57.9% salary increase vs. 34.8%). These findings are even more for striking for participants who were earning less than the annual minimum wage before enrolling in their Voc. Ed. programs. Specifically, both Completers and Leavers with pre-program earnings at this level benefit from their coursework in terms of their earning capacities and that this is much more the case for the former than the latter (544.8% increase in income vs. 341.5%). (Figures 13-16)

VTEA 2001-02 Core Indicators of Performance

There are four "core" indicators that are used by the State Chancellor's Office to gauge the success of VTEA programs/services as these are implemented across the community college districts. The four core indicators are:

Core Indicator 1: Academic and Vocational and Technical Skill Proficiencies.

Core Indicator 2: Completion.

Core Indicator 3A: Placement in Postsecondary Education or Employment.
Core Indicator 3B: Retention in Employment.

Core Indicator 4A: Participation in Non-Traditional Programs.
Core Indicator 4B: Completion of Non-Traditional Programs.

The performances of CCC, DVC, and LMC varied in terms of these indicators relative to the standards set by the State Chancellor's Office.

CCC's best performance on core indicators is in the Business & Management and Public Affairs & Services areas. Alternately, its lowest performances are in the Computer & Information Sciences and Engineering & Related Industrial Technology areas.

DVC's best performance on the core indicators is in the Architecture & Environmental Design, Business & Management, and Communications areas. Conversely, its lowest performances are in the Agricultural & Natural Resources and Consumer Education & Home Economics areas.

LMC's best performances were in the Health area. Its lowest performance is in Computer & Information Science, Engineering & Related Industrial Technology, Consumer Education & Home Economics, and Commercial Services.

The reasons for all these returns are not known. The patterns of data reported reflect the cumulative and interactive effects of a wide range of factors. A discussion with those most intimate with program services may prove instructive and insightful. (Tables 41-43)

Socio-Economic Benefits Generated by CCCCD

A preliminary economic impact study conducted last year by CC Benefits Inc. for CCCCD found evidence for the following estimates:

1. Contra Costa Community College District accounts for $320 million worth of annual earnings in the region, equal to that of roughly 6,500 jobs.
2. Students enjoy a return of 16% on their investment of time and money, higher than the historic return on US stocks and bonds.
3. The State of California benefits from improved health and reduced welfare, unemployment and crime, saving the public some $8.9 million per year.
4. Taxpayers see a return on investments in Contra Costa Community College District of roughly 16% and recover all investments in the first 7.4 years.

These findings support the contention that CCCCD contributes to both the workforce and economic well being of Contra Costa County.

Overview of Vocational Education

Overview of Vocational Education

National Perspective: An Overview*

Vocational Education (Voc. Ed.) in the United States has been in transition for some time. The advent of the 21st century brought with it new challenges to our economy (Levesque, 2000). Historically, the purpose of Voc. Ed. has been to prepare students for entry-level jobs in occupations requiring less than a baccalaureate degree. Over the last 15 years, however, the goal has shifted toward broader preparation that develops the academic, vocational, and technical skills of students in Voc. Ed. programs. This shift began in the mid 1980's, was made into federal law in the 1990 Carl D. Perkins Vocational and Applied Technology Education Act (VTEA), and was confirmed by the 1998 Perkins Act. Integrating academic and vocational education, emphasizing all aspects of an industry, and implementing academic performance measures were among the reform efforts. Voc. Ed. policy now also encourages high school students to continue their studies at the postsecondary level, and two-year postsecondary students to pursue four-year credentials through various articulation or "techprep" arrangements. The traditional focus of Voc. Ed. is giving way to a broader purpose—one that includes greater emphasis on academic preparation and provides a wider range of career choices.

Workforce Preparation Trends: Changes in Voc. Ed. reflect changes in the economy. The United States is shifting from a manufacturing-based economy to one that overwhelmingly provides services and information. This trend has two important implications for Voc. Ed. programs. It signals an ongoing shift in the education and training fields that are required of the U.S. work force as well as shifts in the levels of that education and training. Vocational programs that prepare students for manufacturing jobs include trade and industry programs, such as construction, mechanics and repair, precision production, and transportation and material moving. Vocational programs that prepare students for jobs in the services and information industries include health care and technology and communications, among others. Both of these industries are now calling for enhancements to traditional job skills.

Changing Education and Skill Requirements: Generally, the research literature describes a trend toward greater education and training requirements and a greater need for critical thinking, personal responsibility, and social skills among work force participants. For example, recent projections anticipate that average growth will be greater for occupations requiring at least an associate's degree than for occupations requiring less education. However, these trends are not uniform across industries and occupations, and some disagree about their magnitude. Some emerging occupations require higher education and training requirements (such as a bachelor's degree or moderate- to long-term on-the-job training), while many jobs still demand relatively low education and training levels. In 1996, 39% of all jobs required no more than short-term, on-the-job training.

Understanding these economic and labor market trends provides a context for analyzing trends in Voc. Ed. For, example, if participation in vocational programs parallels changes in

* This section is adapted from a study by Levesque, K. et. al. (2000) for the National Center for Education Statistics (NCES) entitled, Vocational Education in the United States: Toward the Year 2000.

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the economy, one would expect to see a decline in enrollments in trade and industry programs in recent years and an increase in enrollments in service- and information-related programs. Similarly, if Voc. Ed. reflects the labor market trend toward greater education and training requirements, one would expect to find that the academic preparation of students participating in Voc. Ed. has increased in recent years and that more of these participants are seeking and obtaining higher education and training credentials.

Workplace Practices: Changes in the economy and in education are altering workplace practices. These changes have implications for the skills required of employees. Increased global competition has spurred some U.S. businesses to create "high-performance workplaces," relying on flexible and decentralized work practices and multi-skilled workers. These firms, however, are still in the minority. For example, 20% of employers recently surveyed by the National Center for Education Statistics (NCES) reported engaging in performance benchmarking in 1997, and 25% had undergone reengineering. Larger firms were more likely than smaller firms to report these practices, indicating that the percentage of employees affected by these practices may be greater than the percentage of employers reporting them.

The 1994 School-to-Work Opportunities Act also helped bring about employer involvement in school-to-work partnerships and wider implementation of work-based learning, including job shadowing, mentoring, internships, and apprenticeships. However, a minority of firms surveyed by the National Center of Education Statistics (NCES) reported participating in these activities. One-quarter of surveyed employers reported participating in a school-to-work partnership, and 42% reported providing at least one formal work-based learning activity. As above, larger firms were more likely than smaller firms to report these different practices.

Perspectives on Employees: While the general labor market trend may be toward higher education and training requirements, employers have a unique perspective, which is particularly important in the short term. When hiring front-line workers from an established applicant pool, surveyed employers did not rate years of completed schooling or academic performance as highly as attitude and communication skills. However, it may be that years of completed schooling and academic performance are more important during initial applicant screening. It may also be that employers have historically found that schooling measures are not reliable indicators of what students know and can do.

With the evolving economy and changes in education and skill requirements, attention over the last two decades has focused on whether employees are adequately prepared for the demands of the workplace. According to most surveyed employers, the proficiency of their production workers either stayed the same or increased in recent years. In addition, the majority of employers with production employees who participated in work-related learning reported that these employees were superior to comparable new hires in terms of productivity and attitude. Virtually no employers reported that employees with work-based learning experiences were inferior in these two respects to comparable new hires.

Trends in Educational Attainment: The United States has experienced both greater educational participation and higher attainment in recent years, continuing long-standing patterns. More people are attending postsecondary institutions than ever before, and the

average educational attainment of the adult population has been steadily rising. While the total number of adults who earned vocational associate's degrees appeared to increase slightly between 1992 and 1996, this difference was not statistically significant. However, the total number of adults who held academic associate's degrees increased over the four years by approximately an additional 1 million people.

Participation in Postsecondary Vocational Education: Vocational coursework represents a substantial component of sub-baccalaureate students' education. Among all sub-baccalaureate students, about one-half majored in a vocational program area in 1996: the proportion decreased from 54% to 49% from 1990 to 1996. There was a 17.9% increase (67% to 79%) between 1990 and 1996, however, in the proportion of postsecondary vocational students being served by community colleges, with a corresponding decrease at private proprietary institutions.

Student Characteristics: Sub-baccalaureate students with vocational majors were more likely to be older, to have family responsibilities, to receive financial aid, to have a previous postsecondary degree or certificate, and to report higher postsecondary grade-point averages (GPAs) than their academic counterparts. These students with vocational majors also tended to have parents with lower educational attainment: as the education level of their parents increased, students' likelihood of reporting a vocational major generally decreased. Differences by race-ethnicity among sub-baccalaureate students in their probability of having a vocational major were either minimal or not statistically significant. Also, among sub-baccalaureate students, there was no clear association between majoring in a vocational field and disability status.

Specific Occupational Preparation: Business, health, and technical fields (the latter including engineering/science technologies, computers/data processing, and protective services) accounted for large numbers of vocational students' majors. However, between 1990 and 1996, there were small decreases in the proportions of sub-baccalaureate students reporting majors in business, marketing, computers/data processing, and engineering/science technologies. Thus, the absolute level of participation in service- and information-related programs was relatively high in 1996, while the trend in these areas was generally downward over the six-year period. (The expected new report for the 1996-2002 period has yet to be published.)

Among sub-baccalaureate students, gender gaps persisted in the fields of business, health, and "other vocational" fields (where women predominated), as well as in trade and industry, protective services, computers/data processing, and engineering/science technologies (where men predominated). A particularly large gap between the participation of men and women occurred in 1996 in engineering/science technologies, a field in which 12% of male students and only 2% of female students declared a major.

Postsecondary Completion: Among the group of students who first began their postsecondary studies in 1989-90, those with academic majors were more likely than those with vocational majors to have completed at least one postsecondary credential four years later. However, a majority of both academic and vocational majors completed some type of degree or certificate within four years.

Conclusion: Voc. Ed. at the turn of the century is an enterprise in transition. The available data from NCES (Levesque et al, 2000) signal that changes in Voc. Ed. are occurring in the directions advocated by recent reform efforts, in particular, improved academic preparation and greater postsecondary participation. Evidence of change includes findings that the academic preparation of public high school students participating in Voc. Ed. increased between 1982 and 1994; about half of public comprehensive high schools reported integrating academic and Voc. Ed. in 1997, and a similar proportion reported offering tech prep; and from 1982 to 1992, postsecondary enrollment rates within two years of public high school graduation increased significantly for vocational concentrators.

There is mixed evidence that trends in participation in Voc. Ed. programs reflect economic shifts away from manufacturing toward services and information industries. For example, at the high school level, the percentage of graduates who concentrated in trade and industry declined between 1982 and 1994, and the proportions of students who concentrated in health care and in technology and communications increased over the period. However, the percentages of high school graduates who concentrated in health care and in technology and communications were still quite small in 1994 (about 1% each). At the postsecondary level, for example, health and engineering/science technologies were popular vocational majors in 1996. However, there were small decreases between 1990 and 1996 in the proportions of sub-baccalaureate students reporting majors in computers/data processing and in engineering/science technologies. Thus, data on trends in and levels of participation in health and technology programs provided conflicting information about whether vocational program participation is paralleling the economic shift toward services and information industries.

The Organization and Delivery of Vocational Education: As mentioned, federal legislation historically defines vocational education as leading to less than a bachelor's degree. Vocational education at the postsecondary level, therefore, covers associate's degree and sub-baccalaureate certificate programs. Both four-year and two-year postsecondary institutions offer sub-baccalaureate vocational programs. Unlike at the high school level, postsecondary vocational education is commonly offered in both the public and private sectors. In all, six main types of postsecondary institutions offer vocational education programs:

1. Public four-year institutions
2. Public two-year institutions (sometimes referred to as "community colleges")
3. Public less-than-two-year institutions (sometimes referred to as "vocational-technical institutes")
4. Private, not-for-Profit four-year institutions
5. Private, not-for-profit two-year institutions (which includes all private. not-for-Profit less than-four-year institutions)
6. Private, for-profit institutions

The taxonomy used by NCES, list seven broad areas into which most Voc. Ed. majors fall: Agriculture, Business and Office, Marketing and Distribution, Health, Home Economics, Technical Education, and Trade/Industry.

Measuring Participation in Vocational Education: As at the high school level, postsecondary students participate in vocational education to varying degrees and with different intentions. Certain students enter postsecondary institutions with a specific course of study in mind. In some cases, students must apply and be accepted to a vocational program or otherwise formally enroll. For example, associate's degree nursing programs are often in such great demand that they require formal admission with set prerequisites. Some shorter-term vocational certificate programs with a set course of study that students pursue as a cohort also require formal enrollment. In many cases, however, postsecondary students are responsible for their own course enrollment and select from a broad range of academic and vocational courses each semester. Students who have clear degree intentions may follow the recommended course of study for a program that is laid out in the institution's course catalog. However, many students may explore different types of coursework before settling on a "major." Others may enroll for credit but do not have clear intentions of completing a degree or certificate program. Still others may have specific short-term goals for obtaining new skills that do not involve certificate or degree completion. These "learning paths" should be kept in mind when interpreting the data presented in this report, many of which were derived from surveys or census studies of students enrolled for credit in postsecondary institutions.

Information Needed for Decision-Making: Policymakers and vocational educators need information about the status and direction of vocational education in the United States. Accordingly, many research centers are moving to enhance the scope and data comparability of current databases. These enhancements should allow decision-makers to address in richer terms the following questions:

1. What are the major national economic and labor market trends and their implications for vocational education programs and policies?
2. What skills do employers value, and how have skill requirements and worker proficiency changed in recent years?
3. How large is the vocational education enterprise at both the secondary and postsecondary levels, and is it growing, shrinking, or holding constant over time?
4. In what types of vocational education do students enroll at each level, and how much do they take?
5. Who participates in vocational education, and is this changing?
6. Is the academic preparation of students who participate in vocational education improving over time?
7. What is the role of work experience and work-based learning in students' courses of study?
8. To what extent have recent vocational education reform efforts taken hold at the local level?
9. What are the postsecondary and labor market outcomes associated with participation in vocational education?
10. What are the trends in vocational teacher qualifications and experience over time?
11. In what types of professional development do vocational teachers participate?

Economic Trends

Key Terms: In reviewing data bearing on the trend toward a service-based economy to inform Voc. Ed. planning efforts, it is important to have a clear understanding of the key terms frequently used describe it. Confusion can arise because the terms "service-producing industries," the "services industry," "service-producing occupations," and "service occupations" refer to four distinct but overlapping phenomena.

At the most fundamental level, industrial classification systems typically divide employment into two main sectors: service-producing and goods-producing industries. **Service-producing industries** encompass transportation, communications, and public utilities; wholesale and retail trade; finance, insurance, and real estate; government; and "services." **Goods-producing industries** encompass agriculture, mining, construction, and manufacturing. At times, economists compare the service-producing industries and goods-producing industries. At other times, they compare two major industry groups within these broad sectors: the services industry and the manufacturing industry. In 1997, the broader "service-producing industries" classification covered 74.4 % of total employment in the U.S.; the narrower "services industry" classification covered 35.8 % of total employment. (See Figure 1 and Tables 1a-1b.)

Figure 1. Percentage distribution of total employment, by sector and type of industry, and percentage distribution of service-producing occupations by sector and type of industry: 1997

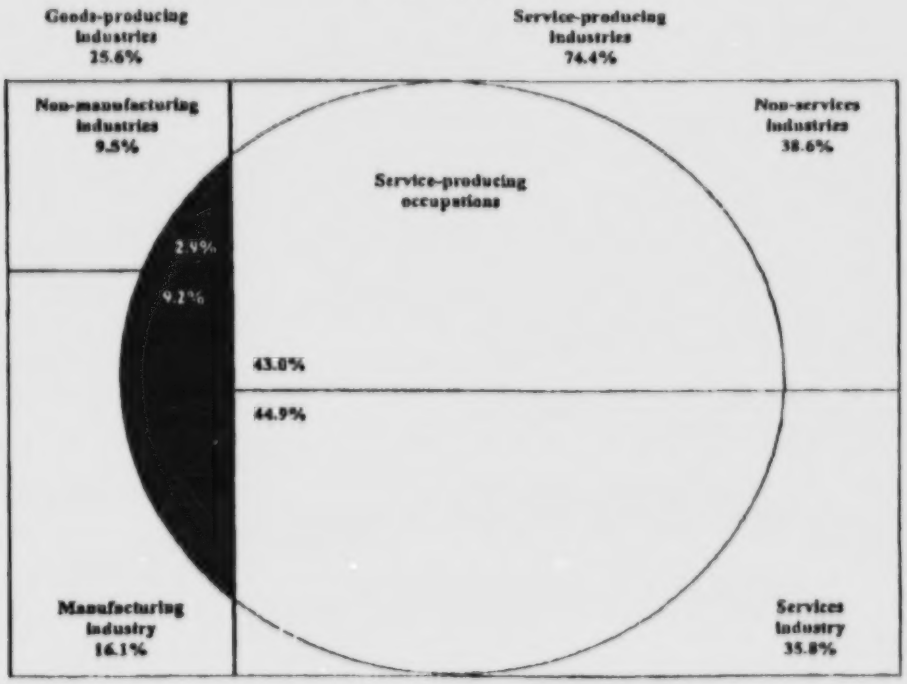

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Table 1a. Column percentage distribution of U.S. workers employed in service-producing and goods-producing occupations according to Industry: 1997

Industry	1997 Occupational Classification								
		Service-producing occupations					Goods-producing occupations		
	Total all occupations	Total	Managerial and professional specialty	Technicians and related support	Sales and administrative support, including clerical	Service	Total	Precision production, craft, repair, operators, fabricators, and laborers	Farming, forestry, and fishing
Total all industries	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Goods-producing industries	25.6	**12.1**	17.5	19.2	10.5	1.9	60.7	58.2	84.0
Agriculture	2.6	0.5	0.5	1.1	0.5	0.1	8.2	0.4	80.6
Mining	0.5	0.3	0.4	0.6	0.2	0.0	1.1	1.2	0.0
Construction	6.4	2.1	3.5	1.1	1.5	0.2	17.5	19.3	0.6
Manufacturing	16.1	9.2	12.8	16.3	8.3	1.5	34.0	37.4	2.7
Service-producing industries	74.4	**87.9**	82.5	80.8	89.5	**98.1**	39.3	41.6	16.0
Transportation and public utilities	7.1	5.4	4.8	8.1	7.6	1.7	11.6	12.8	0.5
Wholesale and retail trade	20.7	23.3	8.0	4.8	39.5	29.1	13.9	15.1	2.9
Finance, insurance, and real estate	6.4	8.6	7.3	3.6	14.2	1.8	0.7	0.7	1.1
Services, except professional	11.9	13.0	11.7	9.0	8.6	**25.2**	9.2	9.33	8.3
Professional services	23.9	31.9	44.9	50.1	15.8	**31.0**	3.0	3.1	2.7
Public administration	4.4	5.8	5.9	5.2	3.9	9.4	0.9	0.9	0.7

NOTE: percentages may not add to 100 due to rounding Estimates appearing as 0.0 may be nonzero but less than 0.05.

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey, 1997, unpublished data

The services industry includes a broad variety of activities, such as health care, advertising, computer and data processing services, personnel supply, private education, social services, legal services, management and public relations, engineering and architectural services, accounting, and recreation. The services industry includes establishments as diverse as Microsoft and 24 Hour Fitness. The manufacturing industry encompasses both durable and nondurable goods production.

To complicate matters further, "**service-producing occupations**" and "**service occupations**" do not overlap neatly with either of the industrial classifications. Service-producing occupations encompass managerial and professional specialty occupations, technicians and related support, sales and administrative support (including clerical), and "service occupations." The narrower service occupations category covers, for example, janitors and cleaners, food preparation workers, waiters and waitresses, nursing aides and orderlies, home health aides, correction officers, and guards. Thus, service-producing occupations include managers in agribusiness companies and computer technicians in high-technology firms, as well as service occupations such as McDonalds cooks and janitors at General Motors.

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Table 1b. Row percentage distribution of U.S. workers employed in service-producing and goods-producing Industries according to occupation: 1997

	1997 Occupational Classification								
		Service-producing occupations					Goods-producing occupations		
Industry	Total all occupations	Total	Managerial and professional specialty	Technicians and related support	Sales and administrative support, including clerical	Service	Total	Precision production, craft, repair, operators, fabricators, and laborers	Farming, forestry, and fishing
Total all industries	100.0	**72.2**	29.1	3.3	26.3	**13.5**	27.8	25.1	2.7
Goods-producing industries	100.0	34.1	19.9	2.4	10.8	1.0	65.9	57.0	8.9
Agriculture	100.0	13.5	6.1	1.4	5.3	0.7	86.6	3.6	83.0
Mining	100.0	39.1	22.6	3.9	12.0	0.6	60.9	60.7	0.2
Construction	100.0	24.2	17.2	0.5	6.0	0.4	75.8	75.5	0.3
Manufacturing	100.0	41.2	23.1	3.3	13.5	1.3	58.8	58.3	0.5
Service-producing industries	100.0	85.3	32.3	3.5	31.7	17.9	14.7	14.1	0.6
Transportation and public utilities	100.0	54.6	19.5	3.7	28.1	3.3	45.4	45.2	0.2
Wholesale and retail trade	100.0	81.3	11.3	0.8	50.2	19.1	18.7	18.3	0.4
Finance, insurance, and real estate	100.0	96.8	33.0	1.8	58.3	3.7	3.2	2.7	0.5
Services, except professional	100.0	78.5	28.6	2.5	18.9	28.6	21.5	19.6	1.9
Professional services	100.0	96.5	54.6	6.8	17.5	17.6	3.5	3.2	0.3
Public administration	100.0	94.4	38.7	3.9	23.3	28.7	5.6	5.2	0.4

NOTE: Percentages may not add to 100 due to rounding

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey, 1997, unpublished data.

In 1997, the broader "service-producing occupations" classification covered 72.2 % of total employment in the U.S.; the narrower "service occupations" classification covered 13.5 % of total employment (Table 1b). Although most service-producing occupations occur in service-producing industries, 12.1% of these occupations occur in goods-producing industries (Figure 1 and Table 1a). In contrast, the vast majority or 98.1% of service occupations occur in service-producing industries, although just 56.2% (25.2% + 31.0%) occur in the services industry (Table 1a).

Ascendance of Services: At the beginning of the 20th century, the U.S. economy was in the midst of a massive transition, one that involved workers moving from agriculture into industry. At the end of the 20th century, the economy is again in a state of flux, with more and more workers finding employment in the services industry as opposed to manufacturing. In 1945, the services industry accounted for 10% of nonfarm employment, compared with 38% for manufacturing. By 1996, services accounted for 29% of nonfarm employment, while manufacturing declined to 15%. These trends are expected to continue into the 21st century. The Bureau of Labor Statistics projects that the service-producing sector will create virtually all of the new jobs between 1996 and 2006, with almost two-thirds of these jobs in the services industry.

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Some have argued that services industry jobs are not as good as manufacturing jobs and that the trend toward services is therefore worrisome for the American worker. However, research shows that the services industry is very diverse and that the shift from manufacturing to services does not necessarily signal deterioration in overall job quality. In 1996, average hourly earnings for workers in the services industry was $11.79—about 92 % of the $12.78 average for manufacturing workers. The wage differential between these two industries had narrowed considerably since 1964, when average hourly earnings in services were 77 % of the manufacturing average in 1996, the distribution, or spread, of earnings was similar for the two industries, so that one could not simply be labeled "low wage" and the other "high wage." A comprehensive assessment of job quality that examined employee benefits, job security, occupational structure, and occupational safety, in addition to average wages, found that the services industry was very diverse in terms of job quality and that many service jobs compared favorably with those in manufacturing.

The type of employment covered under service-related classifications is very broad. Service-producing occupations cover anyone from filing clerks to chief executive officers, and service-producing industries cover anything from fast-food restaurants to corporate banks. Consequently, the shift to a service-based economy describes a complex process that encompasses both low- and high-wage jobs, requires varying skill levels, and presents a broad range of employment opportunities.

The Emerging Information Economy: What accounts for the decline of manufacturing and the movement toward a service-based economy? The decline of manufacturing is often referred to as "economic restructuring," a term that encompasses technological change and new competitive pressures on firms. Assessing the impact of economic restructuring, though, is not a simple matter and is subject to much debate in the economic literature and the popular press. In one area of study, data recently gathered contradicts the prevalent assumption that international trade is the main cause of widespread changes in the manufacturing sector during the past 30 years.

There is greater consensus amongst economists about the role that technology has played in the growth of the service sector. The U.S. economy is in the midst of what Alan Greenspan calls a "once-in-a-century event," a "structural technological advance" in information technology that is changing the shape of the economy and the nature of work. He argues that development of the transistor and integrated circuit and the resulting explosion of advancements in the computing and telecommunications technologies have fundamentally changed the structure of the American economy. Much like the industrial revolution, which caused people to move from working in the fields to working in factories, advances in information technology are causing employment to shift from factories to service-producing firms.

As a result, major industrialized economies are becoming "knowledge-based," where the creation, distribution, and use of information and knowledge-including both technology and human capital-are becoming increasingly important. According to some calculations, more than half of the total gross domestic product in the major industrialized economies is now knowledge-based, including industries such as telecommunications, computers, software, pharmaceuticals, education, and television. High-technology industries have almost doubled their share of manufacturing output over the past two decades to around 25%, and

knowledge-intensive services are growing even faster. By one reckoning, "knowledge workers," from brain surgeons to journalists, account for eight out of every ten new jobs.

Labor Market Trends

Occupational Trends: In order to understand occupational trends clearly, it is important to draw the distinction between "fast-growing occupations" and those with "large job growth." A fast-growing occupation---one, for example, that doubles the number of jobs over a ten-year period-may add only a small absolute number of jobs to the economy. In contrast, a slow-growing occupation, one that increases only 10% or 20% over a ten-year period, may add a large absolute number of jobs, because it began with a much larger employment base. Fast-growing occupations may receive a lot of attention because they represent "emerging" occupations and, possibly, are the wave of the future. However, it is important to consider the contribution of occupations with large job growth as well as these fast-growing occupations, in order to have a complete employment picture.

The Department of Labor's Bureau of Labor Statistics (BLS) periodically publishes employment outlooks that make projections about the fastest-growing occupations and those with the largest job growth. A recent report, published in November 1997, makes projections for the period from 1996 to 2006.

Table 2. Employment by major occupational group: 1996 and projected 2006

	Employment		Change	
Occupational group	1996 (in thousands of jobs)	2006 (in thousands of jobs)	Number (in thousands of jobs)	Percent
All occupations	132,353	150,927	18,574	14.0
Executive, administrative, and managerial	13,542	15,866	2,324	17.2
Professional specialty	18,173	22,998	4,826	26.6
Technicians and related support	4,618	5,558	940	20.4
Marketing and sales	14,633	16,897	2,264	15.5
Administrative support, including clerical	24,019	25,825	1,806	7.5
Service	21,294	25,147	3,853	18.1
Agriculture, forestry, fishing, and related occupations	3,785	3,823	37	1.0
Precision production, craft, and repair	14,446	15,448	1,002	6.9
Operators, fabricators, and laborers	17,843	19,365	1,522	8.5

SOURCE: G. Silvestri, "Occupational Employment Projections to 2006," Monthly Labor Review, Bureau of Labor Statistics, Office of Employment projections, November 1997.

Among the major occupational groups, employment in professional specialty occupations is projected to increase the fastest and add the most jobs between 1996 and 2006 (Table 2). The group with the second fastest growth rate is projected to be technicians and related support occupations, although this group is small and is not expected to add a large number of jobs. The next fastest growing group is service occupations, which together with professional specialty occupations are projected to add nearly half of all new jobs from 1996 and 2006.

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Among detailed occupations, the 10 occupations with the highest projected growth rates are all service-producing occupations, and they can be classified in either the computer technology or health fields (Table 3a). Between 1996 and 2006, these occupations are projected to grow from 69% to 117%, while the average growth rate for all occupations is projected to be 14% over the same period. However, these fastest growing occupations are projected to make up 3% of all jobs by the year 2006.

Table 3a. Employment in the 10 projected fastest-growing occupations: 1996 and projected 2006

Occupations	Employment		Change		Quartile rank by 1996 median weekly earnings of full-time workers	Education and training category
	1996 (in thousands of jobs)	2006 (in thousands of jobs)	Number (in thousands of jobs)	Percent		
All occupations	132,353	150,927	18,574	14	---	---
Ten fastest-growing occupations, 1996-2006						
1. Database administrators, computer support specialists, and all other computer scientists	212	461	249	117	1	Bachelor's degree
2. Computer engineers	216	451	235	109	1	Bachelor's degree
3. Systems analysts	506	1,025	520	103	1	Bachelor's degree
4. Personal and home care aides	202	374	171	85	4	Short-term on-the-job training
5. Physical and corrective therapy	84	151	66	79	4	Moderate-term on-the-job train
6. Home health aides	495	873	378	76	4	Short-term on-the-job training
7. Medical assistants	225	391	166	74	3	Moderate-term on-the-job train
8. Desktop publishing specialists	30	53	22	74	2	Long-term on-the-job training
9. Physical therapists	115	196	81	71	1	Bachelor's degree
10. Occupational therapy assistants and aides	16	26	81	69	3	Moderate-term on-the-job train
Total	2,101	4,001	1,899	90	---	
Share of all jobs (percent)	1.6	2.7	10.2	---	---	

---Not applicable

SOURCE: G, Silvestri. "Occupational Employment Projections to 2006." Monthly Labor Review, Bureau of Labor Statistics. Office of Employment Projections, November 1997

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Table 3b. Employment in the 10 occupations with largest projected job growth: 1996 and projected 2006

Occupation	Employment 1996 (in thousands of jobs)	Employment 2006 (in thousands of jobs)	Change Number (in thousands of jobs)	Change Percent	Quartile rank by 1996 median weekly earnings of full-time workers	Education and training category
All occupations	132,353	150,927	18,574	14	---	---
Ten fastest-growing occupations: 1996-2006						
1. Cashiers	3,146	3,677	530	17	4	Short-term on-the-job training
2. Systems analysts	506	1,025	520	103	1	Bachelor's degree
3. General managers and top executives	3,210	3,677	467	15	1	Work experience plus bachelor's or higher degree
4. Registered nurses	1,971	2,382	411	21	1	Associate's degree
5. Salespersons, retail	4,072	4,481	408	10	3	Short-term on-the -job training
6. Truck drivers, light and heavy	2,719	3,123	404	15	2	Short-term on-the-job training
7. Home health aides	495	873	378	76	4	Short-term on-the-job training
8. Teacher aides and educational assistants	981	1,352	370	38	4	Short-term on-the-job training
9. Nursing aides, orderlies, and attendants	1,312	1,645	333	25	4	Short-term on-the-job training
10. Receptionists and information clerks	1,074	1,392	318	30	4	Short-term on-the-job training
Total	19,156	23,627	4,139	21	---	
Share of all job. (percent)	14.7	15.7	22.3	---	---	

---Not applicable.

SOURCE: G, Silvestri, "Occupational Employment projections to 2006:" Monthly Labor Review, Bureau of Labor Statistics, Office of Employment Projections, November 1997

The 10 detailed occupations with the largest projected increases in number of jobs are somewhat more varied, although they also include several health occupations (Table 3b). These occupations are projected to make up 16% of total employment by 2006. Only systems analysts and home health aides are included on both lists. Nine of the 10 occupations with the largest projected numeric increases will grow at average or above-average rates. The retail sales occupation, projected to grow at a 10% rate, is expected to add more jobs than all but one of the fastest-growing occupations listed in Table 4a.

Changing Education and Skill Requirements: Workforce 2000 estimated that more than half of new jobs between 1984 and 2000 would require some education beyond high school, and one-third would require a bachelor's degree or more. More recent projections anticipate that average growth will be greater for occupations requiring at least an associate's degree than for occupations requiring less education. Indeed, the 10 occupations with the highest projected growth rates in Table 4a have relatively high education and training requirements (8 require bachelor's degrees or moderate- to long-term on-the-job training). In contrast, however, the 10 occupations with the highest projected increases in number of jobs have relatively low education and training requirements (7 require no more than short-term on-the job training, see Table 3b). While some emerging occupations require high education and

training requirements, the majority of jobs still demand relatively low education and training levels. In 1996, 39% of all jobs required no more than short-term on-the-job training (Table 4).

Table 4. Employment and median weekly earnings by education and training category: 1996

Education and training category	Employment		Median weekly earnings, full-time workers
	Number (in thousands of jobs)	Percentage distribution	
All occupations	133,353	100.0	$483
First-professional degree	1,707	1.3	1,057
Doctoral degree	1,016	0.8	847
Master's degree:	1,371	1.0	682
Work experience plus bachelor's or higher degree	8,971	6.8	786
Bachelors degree	15,831	12.0	686
Associate's degree	4,122	3.1	639
Postsecondary vocational training	8,091	6.1	444
Work experience in a related occupation	9,966	7.5	534
Long-term on-the-job training	12,373	9.3	490
Moderate-term on-the-job training	16,793	12.7	434
Short-term on-the--job training	52,125	39.4	337

NOTE: Details may not add to total due to rounding.

SOURCE: G. Silvestri, "Occupational Employment Projections to 2006." Monthly Labor Review, Bureau of Labor Statistics, Office of Employment Projections, November 1997.

Some changes in business practices are demanding greater skills of workers. Increased global competition since World War II has spurred some U.S. businesses to create "high-performance workplaces," relying on flexible and decentralized work practices and multi-skilled workers. Although a growing number of firms are adopting high-performance characteristics, some claim this trend will probably affect only a small number of firms clustered in a few industrial sectors. To the extent that new business practices are adopted, there may be some increase in the required skills of front-line workers. Some have argued that front-line production workers will need to be proficient at using a range of machines and will need to demonstrate increased flexibility, problem-solving, responsibility, teamwork, initiative, and care and attention, especially in monitoring automated equipment.

Some have also argued that the shift to a service-based economy increases the need for critical-thinking and social skills. For example, jobs that require direct contact with customers and clients require problem solving, responsibility, and social skills. Additionally, while customer service occupations (such as cooks, nursing aides, secretaries, clerical workers, and cashiers) may require only modest technical skill levels, workers in these occupations are expected to possess social, communication, problem-solving, and basic academic skill.

Generally, research has shown that obtaining workers with a good work ethic and appropriate social behavior has been a priority for employers. Employers complain about the attitude and character of workers-particularly about absenteeism, an inability to adapt, a lack of

discipline, and negative work behaviors. In response to criticisms about the general employability of the work force, the Secretary's Commission on Achieving Necessary Skills (SCANS) identified a range of skills that all work force participants should have. A recent management study expands on the SCANS list and profiles the set of basic characteristics needed by today's worker for the information-rich, service- and trade-oriented economy of the 21st-Century. These include the following:

Attitudes and Personal Characteristics

1. Adaptability, flexibility, resiliency, and ability to accept ambiguity;
2. Common sense and ability to anticipate downstream consequences;
3. Creativity;
4. Empathy;
5. Positive attitude, good work ethic, and ability to self-manage;
6. Reliability and dependability; and
7. Responsibility, honesty, and integrity.

Essential Skills

1. Computers for simple tasks (word processing);
2. Interpersonal skills, team skills;
3. Numeric and computation skills at a ninth-grade level, including basic money skills;
4. Reading at a ninth-grade level;
5. Speaking and listening; and
6. Writing.

Integrative and Applied Skills

1. Application of technology to tasks;
2. Critical thinking;
3. Customer contact skills;
4. Information use skills;
5. Presentation skills;
6. Problem recognition/definition and solution formulation; and
7. Reasoning.

Premium Skills

1. Ability to understand organizational and contextual issues (legal, environmental);
2. Basic resource management, budgets;
3. Ethics;
4. Foreign language fluency;
5. Globalism, internationalism skills;
6. Multicultural-competence skills;
7. Negotiation skills;
8. Project management and supervision; and
9. Systems thinking.

Its worth noting that 80% of new jobs are expected to require some college education, yet less than half of youth are prepared to undertake college (McCabe, 2000).

In summary, the preponderance of the research evidence argues that there are trends toward greater education and training requirements and a greater need for critical-thinking skills, personal responsibility, and social skills among work force participants. However, these trends are not uniform across industries and occupations, and some disagree about their magnitude.

Returns to Education and Training: Research has consistently documented positive labor market returns to increasing educational attainment. For example, both rates of employment and labor force participation rise with educational attainment. In 1996, 39% of adults who had not completed high school were employed, while 70% of those with at least some college (including those with postsecondary vocational certificates) were employed (Table 5). Similarly, more than half or 56% of people lacking a high school education were not in the labor force, compared with 27% of those with at least some college education. The unemployment rate of those who had not completed high school was twice that of adults with some college education (10% vs. 4% among labor force participants). Additionally, in 1996, median weekly earnings for fulltime workers generally increased as the education and training requirements of an occupation increased (Table 4). For example, while workers in jobs requiring no more than short-term on-the-job training earned $337 per week, on average, those with an associate's degree earned almost twice as much ($639).

Table 5. Percentage distribution of all adults aged 18 years or older and of those in the labor force according to their employment status, by educational attainment: 1996

	Of all adults			Adults in labor force	
Educational attainment	Employed	Unemployed	Not in labor force	Employed	Unemployed
Total	65.1	3.2	31.8	95.3	4.7
Less than high school completion	39.4	4.4	56.2	90.0	10.0
High school completion	63.7	3.7	32.6	94.5	5.5
Some college, no degree	69.7	3.0	27.3	95.9	4.2
Associate's degree	77.5	2.6	20.0	96.8	3.2
Bachelor's degree or higher	79.6	1.7	18.7	97.9	2.1

NOTE: percentages may not add to 100 due to rounding.

SOURCE: U.S. Department of Commerce, Bureau of the Census, October Current Population Survey, 1996.

While there is a consistent and strong association between education and training and labor market success, to some extent, these greater returns may be due to "selection bias." That is, persons attaining higher levels of education may be different from those with lower educational attainment in ways-exclusive of education-that affect labor market success. If this is true, then the impact of obtaining more education and training on success in the labor market, in itself, may be overstated. However, recent increases in income disparities between those with more and less education suggest that there are, in fact, direct returns to education and training.

The trend away from a manufacturing-based economy toward a services-based one has been positive for many individuals and industries. This is not to say, however, that recent changes have benefited everyone. Those without the appropriate education and skills to meet the demands of an increasingly competitive and technical marketplace have watched their wages stagnate and decline over the past 20 years. The rise of information technologies has contributed to the widening inequality in income. Disparities between the more and less educated have increased, and individuals whose work involves less conceptual activities have had either stagnant or falling real income over the past two decades. Table 6 and Figure 2 illustrate that income inequality has widened over the period from 1970 to 1995 between holders of high school diplomas and those who have earned bachelor's degrees or higher.

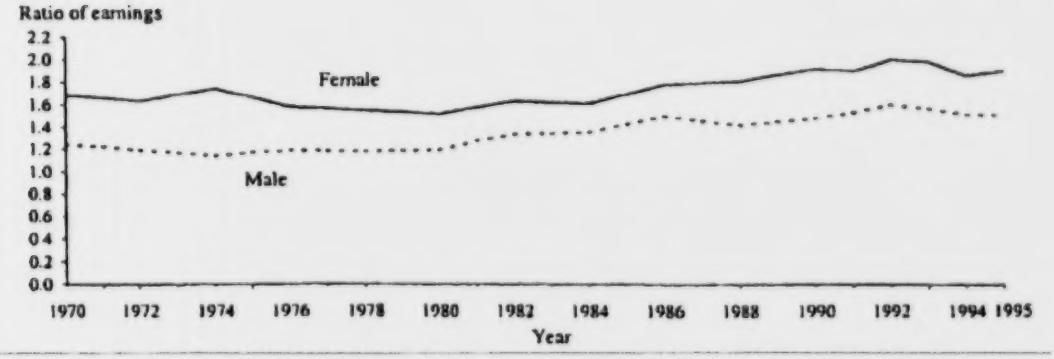
Table 6. Ratio* of median annual earnings of wage and salary workers aged 25-34 whose highest education level was a bachelor's degree or higher to those with a high school diploma, by sex: Selected years 1970-95

Year	Male	Female
1970	1.24	1.68
1972	1.19	1.63
1974	1.14	1.74
1976	1.19	1.58
1978	1.18	1.55
1980	1.19	1.52
1982	1.34	1.63
1984	1.36	1.61
1986	1.50	1.78
1988	1.42	1.81
1990	1.48	1.92
1991	1.53	1.90
1992	1.60	2.00
1993	1.57	1.99
1994	1.52	1.86
1995	1.52	1.91

Source: U.S. Department of Commerce. Bureau of the Census. March Current Population Surveys.

* This ratio is most useful when compared to 1.0. For example, the ratio of 1.52 in 1995 means that males whose highest education level was a bachelors degree or higher earned 52% more than males who had a high school diploma.

Figure 2. Ratio* of median annual earnings of wage and salary workers aged 25-34 with a bachelor's degree or higher to with a high school diploma, by sex: Selected years 1970-95



The reported benefits of higher educational attainment are consistent with recent vocational education reforms emphasizing greater academic preparation and further education and training. Research has also shown the following positive employment and earnings outcomes for participants in vocational education:

1. High school students who concentrate their coursework in a vocational field of study have been shown to have better employment and earnings outcomes than those who take fewer than 2.0 credits in a single vocational field;
2. Vocational completers who obtain a job in an occupation that matches their vocational field of study have been shown to outperform their peers who obtain employment in an unrelated field;
3. Female high school students who complete coursework in the business and health fields have been shown to have better outcomes than those who train in other fields. Similarly, both male and female postsecondary students who complete coursework in the health and technical fields have been shown to have better outcomes than those who train in other vocational fields;
4. Students who pursue their vocational studies at a community college have been shown to have better outcomes than students attending other types of postsecondary institutions;
5. Postsecondary students who complete a vocational program and obtain a degree or certificate have been shown to have better outcomes than those who do not complete or obtain certification;
6. Participating in vocational education has also been shown to have particular economic benefits for women in general and students with disabilities.

* This ratio is most useful when compared to 1.0. For example, the ratio of 1.52 in 1995 means that males whose highest education level was a bachelors degree or higher earned 52% more than males who had a high school diploma.

Hot Programs at Community Colleges

Nock and Shults (2001) recently conducted a study on "hot programs" for the American Association of Community Colleges (AACC). A program was considered to be "hot" if its students were hired immediately upon graduation. Nock and Shults surveyed 1,100 community colleges nationwide, and 205 or 19% of these responded. Their returns, while not representative in the technical sense, are suggestive and give a glimpse of possible trends in workforce preparation. Their key findings are:

1. Reported starting salaries for hot program graduates increased by 21% between 1997 and 2000.

2. 75% of students in the credit hot programs were enrolled in either computer technology or allied health.

3. Dental hygiene has the highest reported salary increase, with a 32% jump since 1997.

4. 65% of respondents offering training for IT vendor certification offer the training on a for-credit basis.

5. 9% of new credit course/programs were added in response to a demand for workers in skilled trades such as construction, welding, and carpentry.

6. The Bureau of Labor Statistics projects that between 1998 and 2008, jobs requiring an associate degree will increase by 31.2%, the largest percentage increase among all educational levels.

These findings are consistent with the national trends reported by Levesque (2000). Additional details can be found in Figures 3-4 and Tables 7-17.

Figure 3. Top 5 Credit Fields of Study, by Percentage of All Hot Programs and Percentage of Hot Program Students Served

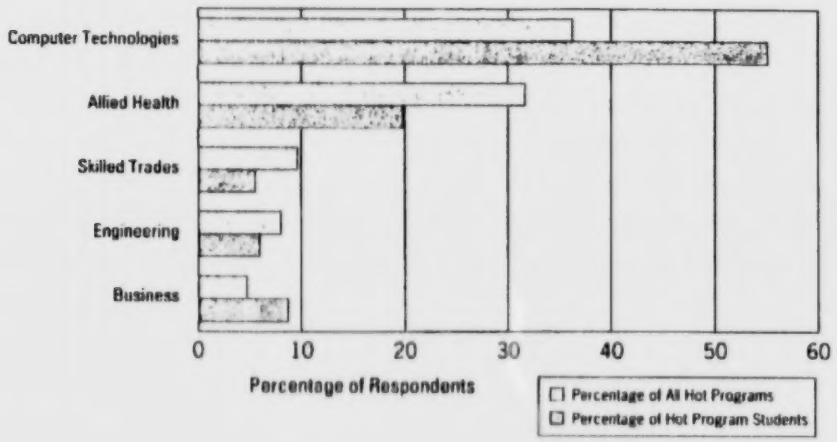


Table 7. 15 Most Frequently Cited Hot Programs

Programs	Percentage of Credit Programs in Survey	Reported Average Starting Salary	Average Students per Program
Registered Nursing	15.3%	$32,757.01	128
General Computer Technologies	12.5%	$34,242.19	221
Computer Networking	8.2%	$38,767.94	170
Engineering-Electric/Electronics	5.3%	$29,464.29	103
Computer Technician/Networking	4.5%	$36,092.15	122
Manufacturing Technology	4.1%	$30,291.65	31
Radiology Technology	3.3%	$32,478.27	22
Digital Media	3.3%	$35,409.08	172
Computer Programming	3.3%	$30,838.11	291
General Skilled Trades	3.1%	$25,598.03	70
Law Enforcement	2.7%	$27,975.27	65
Dental Hygiene	2.5%	$41,907.12	37
Computer-Aided Design	2.5%	$27,968.63	313
Automotive	2.5%	$29,305.72	103
General Allied Health	2.2%	$24,781.57	53

Source: Office of District Research, Contra Costa CCD. March 2002. Adapted from American Association of Community Colleges (AACC) Research Brief: Hot Programs at Community Colleges by Maryam M. Nock and Christopher Shults.

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Table 8. Most Frequently Cited Hot Credit Programs, by Region

Programs	Percentage
Northeast	
General Computer Technologies	22.7%
Registered Nursing	13.3%
Radiology Technology	6.7%
Dental Hygiene	5.3%
Medical Office Assistant	5.3%
Southern	
Registered Nursing	16.9%
General Computer Technologies	11.0%
Computer Networking	10.3%
Engineering-Electric/Electronics	7.4%
Manufacturing Technology	5.9%
South-Central	
Registered Nursing	18.3%
General Computer Technologies	15.5%
Radiology Technology	7.0%
Aviation	5.6%
Computer-Aided Design	4.2%

Programs	Percentage
Pacific	
Networking	16.7%
Computer Technician/Networking	9.5%
General Computer Technologies	8.3%
Registered Nursing	7.1%
Digital Media	6.0%
North-Central	
Registered Nursing	10.5%
General Computer Technologies	10.5%
Computer Networking	10.5%
General Allied Health	7.9%
Engineering-Electric/Electronics	7.9%
Midwest	
Registered Nursing	16.9%
General Computer Technologies	10.0%
Networking	10.0%
Computer Technician/Networking	5.6%
Manufacturing Technology	5.6%

Table 9. Top 10 Credit Programs, by Percentage of Students Enrolled

Programs	Percentage of Hot Program Students Enrolled
General Computer Technologies	21.2%
Registered Nursing	14.9%
Computer Networking	10.7%
Computer Programming	7.4%
Computer-Aided Design	6.1%
Business Administration	4.9%
Digital Media	4.4%
Computer Technician/Networking	4.2%
Engineering-Electric/Electronics	4.2%
Accounting	2.3%

Source: Office of District Research, Contra Costa CCD. March 2002. Adapted from American Association of Community Colleges (AACC) Research Brief: Hot Programs at Community Colleges by Maryam M. Nock and Christopher Shults.

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Table 10. Mean Income of U.S. Population Aged 18 and Older, by Educational Attainment: 1996 to 1999

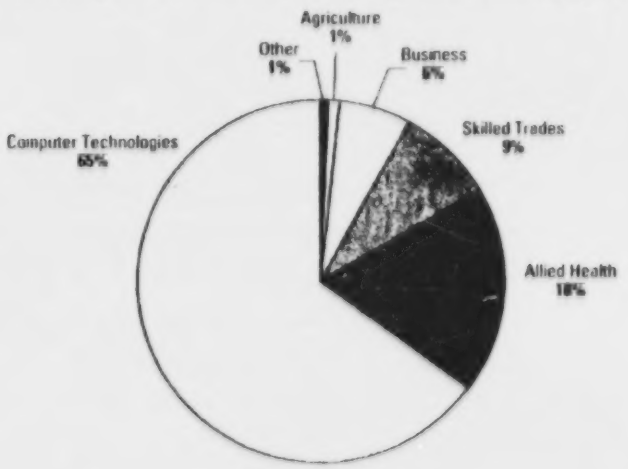
Educational Attainment	1996	1999	Percent Change
High School Graduate	$22,154	$24,572	10.9%
Some College, No Degree	$23,937	$26,958	12.6%
Associate Degree	$28,514	$32,152	12.8%
Bachelor's Degree	$45,526	$52,883	16.2%

Source: U.S. Bureau of the Census 2000

Table 11. Top 10 Credit Programs, by Starting Salary

Programs	Average Starting Salary	Minimum Reported Starting Salary	Maximum Reported Starting Salary
Dental Hygiene	$41,907	$30,000	$72,800
Computer Networking	$38,768	$22,000	$55,500
Hospitality	$37,478	$25,500	$42,500
Computer Technician/Networking	$36,092	$24,250	$50,000
Digital Media	$35,409	$20,000	$52,500
Fire Services	$34,483	$32,000	$35,000
General Computer Technologies	$34,242	$14,560	$50,000
Registered Nursing	$32,757	$21,000	$50,000
Radiology Technology	$32,478	$18,000	$60,000
Computer Hardware	$31,434	$17,368	$35,000

Figure 4. Percentage of Credit Courses/Programs Added, by Field of Study



Source: Office of District Research, Contra Costa CCD. March 2002. Adapted from American Association of Community Colleges (AACC) Research Brief: Hot Programs at Community Colleges by Maryam M. Nock and Christopher Shults.

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Table 12. 10 Most Frequently Cited Hot Noncredit Programs

Programs	Percentage of All Reported Hot Noncredit Programs
Computer Networking	15.2%
Computer Literacy	10.9%
Computer Programming	6.0%
Nursing Aide	6.0%
Other Allied Health	4.9%
Workplace Skills	4.9%
General Skilled Trades	4.3%
Office Support	4.3%
Law Enforcement	3.8%
Web	3.8%

Table 13. 10 Most Frequently Added Noncredit Courses/Programs: 1997 to 2000

Courses/Programs	Percentage of Total Noncredit Programs/Courses Added
Computer Networking	18.5%
Office Support	8.2%
Workplace Skills	8.2%
Computer Literacy	5.1%
Computer Programming	5.1%
Web	4.1%
Business Administration	3.6%
Spanish as a Second Language	3.6%
Manufacturing Technology	3.6%
Truck Driving	3.1%

Source: Office of District Research, Contra Costa CCD. March 2002. Adapted from American Association of Community Colleges (AACC) Research Brief: Hot Programs at Community Colleges by Maryam M. Nock and Christopher Shults.

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Table 14. Top 10 Certification Training Programs Offered, by Credit Status

Certification Training Offered	Percentage of Institutions Offering for Credit
Cisco Certified Network Associate	45.9%
Microsoft Office User Specialist	40.5%
Microsoft Certified Professional	35.1%
Microsoft Certified Systems Engineer	34.6%
CompTIA A+	32.7%
Certified Novell Administrator	25.9%
Cisco Certified Network Professional	20.5%
Certified Novell Engineer	16.1%
CompTIA Network+	13.2%
Microsoft Certified Systems Developer	9.8%

Certification Training Offered	Percentage of Institutions Offering Noncredit
Microsoft Office User Specialist	25.9%
CompTIA A+	22.4%
Microsoft Certified Systems Engineer	21.5%
Cisco Certified Network Associate	18.1%
Microsoft Certified Professional	18.1%
CompTIA Network+	9.3%
Cisco Certified Network Professional	8.8%
Certified Novell Administrator	7.3%
Certified Novell Engineer	5.9%
Microsoft Certified Systems Developer	4.9%

Table 15. Employment and Total Projected Job Openings, by Education and Training Category: 1998 to 2008

(number of jobs in thousands)

Education & Training Category	Employment				Change, 1998-2008		Total Job Openings due to Growth & Net Replacements	
	Number		Percent Distribution		Number	Percent	Number	Percent Distribution
	[illegible]	[illegible]	[illegible]	[illegible]				
First professional degree	1,908	2,215	1.4%	1.4%	308	16.1%	617	1.1%
Doctoral degree	996	1,228	0.7%	0.8%	232	23.3%	502	0.9%
Master's degree	940	1,115	0.7%	0.7%	174	18.6%	374	0.7%
Work experience plus bachelor's or higher degree	9,595	11,276	6.8%	7.0%	1,680	17.5%	3,372	6.1%
Bachelor's degree	17,379	21,596	12.4%	13.4%	4,217	24.3%	7,822	14.2%
Associate degree	4,930	6,467	3.5%	4.0%	1,537	31.2%	2,422	4.4%
Postsecondary vocational training	4,508	5,151	3.2%	3.2%	643	14.3%	1,680	3.1%
Work experience in a related occupation	11,174	12,490	8.0%	7.8%	1,316	11.8%	3,699	6.7%
Long-term on-the-job training	13,436	14,604	9.6%	9.1%	1,168	8.7%	4,411	8.0%
Moderate-term on-the-job training	20,521	21,952	14.6%	13.7%	1,430	7.0%	6,218	11.3%
Short-term on-the-job training	55,125	62,701	39.2%	39.0%	7,576	13.7%	23,890	43.4%

Source: U.S. Bureau of Labor Statistics 2000a

Source: Office of District Research, Contra Costa CCD. March 2002. Adapted from American Association of Community Colleges (AACC) Research Brief: Hot Programs at Community Colleges by Maryam M. Nock and Christopher Shults.

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Table 16. The 10 U.S. Occupations with the Fastest Projected Employment Growth: 1998 to 2008

(number of jobs in thousands)

Occupation	Employment (Number of Jobs)		Change, 1998-2008	
	1998	2008	Number	Percent
Computer engineers	299	622	323	108%
Computer support specialists	429	869	439	102%
Systems analysts	617	1,194	577	94%
Database administrators	87	155	67	77%
Desktop publishing specialists	26	44	19	73%
Paralegals and legal assistants	136	220	84	62%
Personal care and home health aides	746	1,179	433	58%
Medical assistants	252	398	146	58%
Social and human service assistants	268	410	141	53%
Physician assistants	66	98	32	48%

Source: U.S. Bureau of Labor Statistics 2000b

Table 17. The 10 U.S. Industries with the Fastest Projected Employment Growth: 1998 to 2008

(number of jobs in thousands)

Industry Description	Employment (Number of Jobs)		Change, 1998-2008	
	1998	2008	Number	Percent
Computer and data processing services	1,599	3,472	1,872	117%
Health services, not elsewhere classified	1,209	2,018	809	67%
Residential care	747	1,171	424	57%
Management and public relations	1,034	1,500	466	45%
Personnel supply services	3,230	4,623	1,393	43%
Miscellaneous equipment rental and leasing	258	369	111	43%
Museums, botanical and zoological gardens	93	131	39	42%
Research and testing services	614	861	247	40%
Miscellaneous transportation services	236	329	94	40%
Security and commodity brokers	645	900	255	40%

Source: U.S. Bureau of Labor Statistics 2000c

Source: Office of District Research, Contra Costa CCD. March 2002. Adapted from American Association of Community Colleges (AACC) Research Brief: Hot Programs at Community Colleges by Maryam M. Nock and Christopher Shults.

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Vocational Education and the California Community College System*

The State Plan presented below was approved by The Board of Governors of the California Community Colleges, the California State Department, and the U.S. Department of Education. The State Plan addresses the requirements of the Carl D. Perkins Vocational and Technical Education Act (VTEA) of 1998. It is hoped that the State Plan will open up discussions of what Vocational Education should be in California and how it should fit into the larger educational and economic context.

Demographic and Economic Context: California's economy is the fifth largest in the world, and its regions vary considerably in industrial composition, population, and economic status. State planning for vocational and technical education must take into account these important differences.

Economic Regions of the State: To illustrate the range of economic conditions throughout California, the State Plan Committee examined the unemployment rate and construction growth in major metropolitan areas in the spring of 1999. The Committee notes that large portions of the state, including Sacramento, San Diego, Riverside, and San Bernardino counties, enjoyed essentially full employment (less than 5% unemployment), while the highest-employment county in the Central Valley had a 12% unemployment rate. Another indicator of economic condition is construction growth. Here too the regions reported highly variable results. Some counties reported a 20% to 25% decline in residential construction, while others were engaged in an unprecedented building boom.

In a state as large and complex as California, geographical differences are critical. To meet the educational and occupational training needs of citizens throughout the state, the state plan for vocational and technical education must take into account regional differences in industry needs, economic structure, and availability of training resources.

Statewide Employment Growth by Industry, 1996-2006: The following are projected employment changes between 1996 and 2006 prepared by California's Employment Development Department (EDD) for major industries, for occupational categories, and for segments of those industries showing the largest absolute changes in employment. Overall, EDD projects an increase in employment from 1996 to 2006 of more than three million, a 25% rise. Nearly all industries, with a few minor exceptions, are expected to gain employees.

Largest Absolute Changes:

1. Business services (+641,000) and retail trade (+500,000) will account for more than one-third of the increase in jobs.
2. Health services (+278,000) and local education (+218,000) will make up an additional 16% of the increase in employment.

* This section is adapted from a publication by the California Department of Education entitled, 2000-2004 California State Plan for Vocational and Technical Education: Executive Summary, September 2000.

3. Other large gains in jobs will be found in the manufacturing of durable goods (particularly computers, office equipment, and instruments), engineering and management services, construction, state and local non-education government, and wholesale trade.
4. The largest declines in employment will be in depository institutions (-27,700); manufacturers of transportation equipment, excluding motor vehicles (-13,700); federal Department of Defense agencies (-8,700); manufacturers of search and navigation equipment (-8,700); and manufacturers of electronic components (-5,600).

Largest Percentage Changes:

1. Among large-industry categories, the leaders in percentage gains of employment will be manufacturers of computer and office equipment (+69%), business services (+66%), social services (+46%), and trucking and warehousing businesses (+44%).
2. Also in large industries, gains in employment of between 30 and 40 percent are shown in air transportation, eating and dining places, engineering and management services, amusement and recreation services, and motion pictures.
3. Industries demonstrating the largest declines in employment are manufacturers of glass and glassware (-38.3%), structural clay products (-39.1%), hydraulic cement (-37.5%), and metal cans and shipping containers (-37.5%). It should be noted that these are all relatively small industries.

Implications for Vocational and Technical Education in California: What do the projections tell us about the needs of vocational and technical education? First, the sheer volume of educational opportunities must increase dramatically to meet the demand created by California's burgeoning population. Merely keeping pace with rapid enrollment growth in both secondary and postsecondary education will require Herculean efforts in both program expansion and the provision of adequate facilities and equipment.

Second, changes in work organizations and technology will make frontline workers responsible for operational improvement, problem solving, and quality control. Workers will have to work "smarter" and apply advanced computation and communication skills. This new set of skills blends what have traditionally been separate academic and vocational competencies.

Third, in California all students-not just a select group bound for baccalaureate degrees should gain advanced literacy and mathematics skills as well as sophisticated technical competencies and an ability to understand the interdependency among all aspects of an industry. Attaining this goal will require fundamental improvements in secondary and postsecondary vocational and technical education programs. Program improvements will build on existing endeavors and strengthen connections among the complementary facets of career preparation. California vocational and technical education, as described in more detail later, will:

- Integrate theory and application.
- Combine technical, computational, reasoning, and communication skills.
- Incorporate school- and work-based learning experiences.

- Better connect secondary and postsecondary educational opportunities.
- Strengthen connections among education, business, labor, and government.

Fourth, for the entire California education system, improvement of vocational and technical education is not an independent reform. Rather, it is interrelated with other statewide reforms, including clearer high-level learning goals for elementary and middle school students, higher secondary graduation and subject matter standards, additions to the University of California and California State University entry requirements, efforts to improve gender equity, services to disadvantaged students, service-learning, and other secondary and postsecondary initiatives. By declaring that all students are both vocational and academic, and that effective learning is not the sole domain of either academic or vocational and technical education programs, California has established an important principle for the improvement of vocational and technical education programs. Nothing short of this dual preparation will allow students to climb a ladder of wages and responsibility.

Fifth, beyond preparation for immediate employment, vocational and technical education must anticipate that change will continue at a rapid pace. Today's students will need the capacity based on a solid grasp of academic fundamentals in language, mathematics, and science to embrace future changes no one can foresee. A strong academic foundation is necessary not only for work and further education but also for the ability to deal with issues students will face in daily life as parents and citizens.

Sixth, California's extraordinary cultural diversity imposes additional responsibilities on vocational and technical education. Almost every working person interacts with people at work—coworkers, supervisors, subordinates, clients, or customers-who differ in race, primary language, or country of origin. People are likely to be more effective in this kind of setting if they are acquainted with one another's history, language, and culture. Vocational and technical education programs must continue to include some of the subjects known as humanities. Again, these are valuable not only for work but also for enhanced participation in a civilized society.

Seventh, responding to these challenges and opportunities requires a kind of vocational and technical education that is technically sound and up-to-date as well as academically rigorous and culturally inclusive. Vocational and technical education must be an integral part of the educational system from elementary school through graduate school, continually relating theoretical ideas and concepts to the practical world of work and utilizing job shadowing, internships, mentoring, and early career exposure. It should offer something useful and interesting to any student, regardless of gender, learning style, language proficiency, socioeconomic background, gender, or disability. Above all, in a world of accelerating change, vocational and technical education should aim to keep students' options open.

More specifically, vocational and technical instruction must be delivered in a way that enhances preparation for further education because the great majority of young people aspire to some form of postsecondary education. The growth in postsecondary enrollment is in part a response to the dramatically increased economic payoff for education beyond high school-students with Associate in Arts degrees from community college or baccalaureate degrees from four-year colleges have substantially higher potential incomes. Keeping students' options open, therefore, means respecting students' and parents' aspirations by ensuring that

students have the opportunity to fulfill the academic prerequisites necessary for admission to, and success in, postsecondary institutions as well as proper preparation for further vocational and technical education.

State Plan and Priorities

California's Field Review Committee, a distinguished broad-based group appointed by the Chancellor and the Superintendent, was charged with providing advice on the development of the State Plan. The committee was asked to pay particular attention to the new emphases in the Perkins Act on accountability and to assist the state in determining the issues to which the state could most appropriately turn its attention. Its recommendations are listed below by the categories that emerged:

Accountability

Recommendation 1. Spell out carefully every dimension of the new accountability mechanism. Specify standards, performance criteria, definitions of eligible students and courses, and sensible consequences (rewards and interventions). Utilize existing data collection systems as much as possible. Integrate vocational and technical education data needs within existing effective data collection efforts.

Recommendation 2. Maximize the use of accountability information to improve local programs and enhance student performance. Teachers and college faculty must be able to receive the accountability information in formats useful to them and must be given time to review the information and use it to improve programs.

Curriculum Development

Recommendation 3. Emphasize the development and continuous improvement of integrated curriculum based on up-to-date industry standards (developed in partnership with industry), statewide tests, SCANs, and other generic skills, including education for a global economy.

Professional Development

Recommendation 4. Create a sustainable, systematic, sequential, and comprehensive professional development program for vocational and technical educators that includes provisions for academic faculty, administrators, counselors, and board members in its design and development.

Linkages and Partnerships

Recommendation 5. Create statewide industry-based advisory committees serving as advisers to the Chancellor's Office of the Community Colleges and the California Department of Education for all secondary and postsecondary vocational and technical education programs. Such committees should advise and assist in the development of student competencies, model curricula, and professional development priorities. Continually emphasize collaborative efforts, especially as they relate to linking with other statewide workforce development initiatives.

Student Support Services

Recommendation 6. Help counselors, librarians, and other student and instructional support personnel obtain accurate, up-to-date information about job markets, skills, and requirements.

Student Organizations

Recommendation 7. Continue support for vocational student organizations. Better integrate student-sponsored activities across student organizations.

Funding

Recommendation 8. As a condition of funding, ensure that Perkins Act dollars are used to improve student performance.

Recommendation 9. Guarantee that recipients of scarce vocational and technical education funds have made a sufficient local effort to provide high-quality vocational and technical education programs. Promote the exploration of matching requirements or other mechanisms to accomplish this goal.

Recommendation 10. Restructure multiple funding streams in order to eliminate redundant and sometimes conflicting requirements and to maximize resources from various funding sources.

Administrative and State Leadership by the Chancellor's Office

Both the California Department of Education and the California Community Colleges play a role in vocational and technical education. Their plans are presented below.

California Department of Education

Some important "big picture" themes that form the basis for the particular strategic responses chosen by the Department are summarized here. These themes are closely aligned with the basic principles embodied in the Perkins Act. They are:

A Comprehensive, Sequential Approach:

A repeated refrain in this plan is that vocational and technical education must be viewed as a critical part of a comprehensive education system. This broader view encompasses all or parts of several initiatives relating to the delivery of vocational and technical education as well as other initiatives relating to high school reform in general. Powerful and interrelated components of a comprehensive approach can be found in California's existing vocational and technical subject matter projects, the Tech-Prep program, California's efforts to implement the vision in Second-to-None, California's Partnership Academies, and the New American High School initiative sponsored by the U.S. Department of Education. The underlying supposition is that vocational and technical education, if it is to be successful, must be an integral part of schools' and districts' overall reform efforts.

Successful versions of comprehensive models share the following features:

- An integrated program of learning that combines basic academic and career-related content.
- Interdisciplinary course work that connects basic academics to a career- or work-related context.
- Articulated course work that spans the education segments and is sequentially more challenging.
- Substantial support from partners (especially business and higher education) beyond the school setting.

Focus on Industry Clusters or Sectors:

The Department of Education has determined that in order to prepare students for careers with high skill levels, high wages, employment opportunities, and career ladder opportunities, the appropriate focus should be on the most promising industry sectors. After a long and careful review, the Department identified the 15 highest-employing or potentially highest-employing industry groups within California. The Department is engaged in developing curriculum for each of those industry sectors:

- Agriculture and Natural Resources
- Arts, Media, and Entertainment Technology
- Building Trades and Construction
- Business and Finance
- Energy and Utilities
- Engineering
- Fashion and Interior Design Health Services
- Hospitality, Tourism, and Recreation
- Information Technology
- Manufacturing and Product Development
- Public and Private Education Services
- Public Services
- Retail and Wholesale Trade
- Transportation

These industry sectors were selected on the following criteria. Each industry sector:

- Has an identifiable industry connection within the sector
- Offers at least 100 individual job titles
- Has a core content of at least seven standards
- Offers high employment opportunity
- Has a high growth potential
- Provides for work-based learning opportunities

The U. S. Department of Education has identified 16 career clusters that have been cross-walked with those selected by California. These 16 career clusters will be used for reporting purposes as each state submits its Vocational and Technical Education Annual Performance Report.

Leveraging of Multiple Resources:

A comprehensive approach to vocational and technical education that combines continuity with sequenced content from the earliest education experience to the point of departure must be put into place. Only by combining all available resources can this goal be accomplished. To increase the funds available to do the job, resources from the following federally funded initiatives should be pulled together: Vocational-Technical Education Act (VTEA), Elementary and Secondary Education Act (ESEA), Improving America's Schools Act (IASA), School-to-Work Opportunities Act (STWOA), Workforce Investment Act (WIA), and Service-Learning. Several state-funded programs can also be leveraged to support school reform: Apprenticeship, CalWorks, Student leadership (AB8), Agriculture and Home Economics Careers in Technology Incentive Grants, Partnership Academies, and the (academic) Subject Matter Projects.

Each of these resources, though unique in funding and reporting requirements, can be utilized to improve vocational and technical education programs. Administration and leadership for the various programs and initiatives are situated primarily in the Standards and High School Development Division in the Department, thus making it possible to better integrate activities and utilize multiple resources for a single goal of program improvement.

California Community College, Chancellor's Office

The Chancellor's Office will use state leadership funds in accordance with Section 124 of the Vocational-Technical Education Act (VTEA) for the purpose of improving vocational and technical education programs. Activities will concentrate in the five major categories of performance accountability, curriculum development, professional development, student support structures, and partnership development. Funds will be made available to support a variety of activities and special projects that will be designed to address State Plan priorities. State staff will conduct, arrange, and/or facilitate some of the leadership activities. Most activities and projects will be conducted through funded contracts that will result from a competitive request for application process.

The VTEA-required set-aside for supporting activities to serve individuals in state institutions will provide funds to establish annual interagency agreements with these institutions for leadership activities to initiate, improve, and expand vocational and technical education programs. Prior to receiving funds for the annual interagency agreements, the institutions shall submit a report that describes outcomes from the previous year's activities and an annual plan outlining their activities and expected outcomes. The VTEA-required set-aside for nontraditional training and employment will fund activities to improve and expand training in programs that are nontraditional as determined by gender enrollment.

Priorities:

The following state leadership priorities and specific activities are planned to be implemented and/or completed during the period of the State Plan:

1. Performance Accountability: Activities will be directed toward the implementation and operation of the community college portion of the VTEA performance accountability system. These include determining performance indicators, levels of performance, and performance goals and maximizing the utility of accountability information by providing local districts with data and other information that can be used by faculty and administration to improve student performance. The accountability process will be coordinated with other accountability requirements, including those of the Workforce Investment Act (WIA).

2. Curriculum Development and Improvement: Activities related to this goal will concentrate on reviewing, upgrading, and improving curriculum currency, value, rigor, and delivery of instruction and, where business and industry needs dictate, developing new courses and programs that satisfy the needs of changing and emerging occupations. Curriculum development and improvement will be linked to occupational disciplines and must be based upon the integration of up-to-date industry standards. Improving the quality of vocational and technical education programs and courses will include the integration of academics, SCANS competencies, and other generic skills.

3. Professional Development: A major thrust will be directed toward ensuring that faculties are current with industry standards and have the resources to teach to industry standards. Efforts will be directed toward increasing the number of faculty engaged in integrating academic and vocational and technical education, implementing work-based learning, using technology in the curriculum and in the delivery of instruction, and assisting special population students in gaining access to and achieving success in vocational and technical education programs. Provisions will be made for the inclusion of administrators, all faculty, counselors, and local district board members in appropriately designed professional development activities. Local educational personnel and representatives of various state-level organizations, such as the academic senate, California Community Colleges Association of Occupational Educators, state advisory committees and regional consortia, as well as representatives of business and industry, will assist in the identification of priorities for professional development activities. These individuals and groups will also assist in the design and delivery of professional development programs and activities.

4. Student Support Structures: Activities will be directed toward increasing access to and success in vocational and technical education for all students who elect to enroll in vocational and technical education programs, particularly members of special populations, through a variety of support structures and services (e. g., assessment, counseling, matriculation services, English as a second language, basic skills instruction, adult noncredit instruction, learning laboratories, tutorials, and assistance with study skills). Up-to-date information regarding the job market and employment and job skills requirements will be developed and made available to counselors, librarians, and other instructional support personnel to assist students in making informed choices on career decisions. Where appropriate, information regarding community college vocational and technical education programs and services, job market information, and employment and job skills requirements will be made available through the One-Stop delivery systems. Additional support for students in gaining knowledge regarding specific industry clusters and acquiring leadership skills will be provided through student organizations and other student leadership activities.

5. Partnership Development: Efforts will improve linkages, cooperation, and collaboration among a variety of partners to produce responsive solutions to workforce development needs. Vocational and technical education partners include secondary and postsecondary education, business, industry, labor, state and local government, the community, and many organizations that have as their goal the improvement and expansion of vocational and technical education, workforce development, and the economic development of the state.

Accountability Measures

Accountability measures are grouped in two categories: Secondary Education Indicators of Performance and Higher Education Indicators of Performance.

Secondary Education Indicators of Performance:

Local educational agencies will report data on students taking one or more vocational courses, on vocational program completers, on special populations, and on Tech-Prep students, controlling for industry sector. The state will provide local educational agencies with guidelines to help administrators link vocational program sequences with specific industry sectors. Data will be aggregated across local vocational program areas and cross-walked into the 16 broad career areas defined by the Office of Vocational and Adult Education. Data will also be collected and reported separately on adult students participating in secondary programs (where such data exists).

Academic Skill Proficiencies:

Performance Goal: To increase the number of vocational completers who attain challenging academic proficiencies.

Core Indicator

- The state will increase the percentage of 12th grade vocational program completers who earn a cumulative grade point of 2.5 or higher.

Level of Performance: At the state level 60% of vocational program completers will earn a cumulative grade point average of 2.5 or higher (A=4.0) by the 2003-04 academic year. Since the state does not presently have cumulative grade point average data on vocational program completers, the state will adjust this level of performance when data on student performance become available.

Occupational Skill Proficiencies:

Performance Goal. To increase the number of vocational program completers who attain the vocational skills they need to pursue further education or work.

Core Indicators

- The state will increase the percentage of 12th grade secondary students who complete a vocational program sequence after completing a vocational course in any vocational program area as of June 30 of their senior year.

- The state will increase the percentage of adult Regional Occupational Centers/Programs (ROC/Ps) and adult education students who earn a Certificate of Completion.

Level of Performance:

Secondary Program completion. The state does not presently have data on the percentage of 12th grade secondary students who complete a vocational course in any vocational program area. As a transitional measure, the state has identified that 14% of all students complete course work in a vocational program area after enrolling in any vocational course. The state will adopt new measures and revise its levels of performance when data on 12th grade student performance will be available.

Adult certification. The percentage of adults earning a Certificate of Completion will increase from 43.8% to 55% over the five years of the Perkins Act. The level is to be established based on the collection of 1999-2000 base year data. Until then, the state is planning to use 1998-99 adult vocational program completion data as a transitional proxy measure of occupational attainment. Since most, if not all, adults who complete a vocational program in an ROC/P or adult education are awarded a Certificate of Completion, the preferred measure, this approach will enable the state to provide accurate baseline numbers. As a baseline transitional measure, the state has identified that 79.3% of all adults complete a vocational program after taking initial course work in an ROC/P or adult education.

Secondary School Completion:

Performance Goal: To increase the percentage of students who complete their education.

Core Indicator

- The state will increase the percentage of 12th grade vocational program completers who receive a secondary school diploma or its equivalent by June 30 of their senior year.

Level of Performance: The percentage of entering 12th grade vocational program completers who graduate from high school will equal or exceed 89.4% in 1999-2000 and increase to 92% by the 2003-04 academic year. This level of performance will be revised when data on student performance will be available.

Placement in Postsecondary Education, Employment, or the Military:

Performance Goal: To increase the percentage of vocational program completers who are placed in postsecondary education or training, employment, or the military.

Core Indicators

- The state will increase the percentage of secondary vocational program completers who are placed in further education, employment, or the military within the six months following program completion.

- The state will increase the percentage of adult ROC/P and adult education vocational program completers who are placed in further education, employment, or the military within the six months following receipt of a Certificate of Completion.

Level of Performance: The placement rate for secondary vocational program completers will meet or exceed 69.1% in 1999-2000 and increase to 75% by the 2003-04 academic year. This level of performance will be revised when data on student performance will be available. The placement rate for adult vocational program completers will meet or exceed 57.2% in 1999-2000 and increase to 63% by the 2003-04 academic year. This level of performance will be revised when data on student performance will be available.

Nontraditional Programs:

Performance Goal: To increase the rates of participation and completion of males and females in industry clusters preparing students for occupations in which one gender constitutes less than 25% of those employed.

Core Indicators

- The state will increase the percentage of females at the secondary level participating in male-dominated industry clusters and males at the secondary level participating in female-dominated industry clusters associated with nontraditional employment.
- The state will increase the percentage of females at the secondary level completing male-dominated industry clusters and males at the secondary level completing female-dominated industry clusters associated with nontraditional employment.
- The state will increase the percentage of adult females enrolled in ROC/Ps participating in male-dominated industry clusters and adult males enrolled in ROC/Ps participating in female-dominated industry clusters associated with nontraditional employment.
- The state will increase the percentage of adult females enrolled in ROC/Ps completing male-dominated industry clusters and adult males enrolled in ROC/Ps completing female-dominated industry clusters associated with nontraditional employment.

Level of Performance: The percentage of females and males participating in industry clusters associated with nontraditional employment will rise from 16.1 in 1999-2000 to 20% by the 2003-04 academic year. The percentage of females and males completing programs in industry clusters associated with nontraditional employment will rise from 23.1% in 1999-2000 to 25% by the 2003-04 academic year. This level of performance will be revised when data on student performance will be available.

Higher Education Indicators of Performance:

Higher education institutions will collect and report data by vocational program area. Data will be aggregated across vocational program areas for federal reporting purposes; however, the state will provide program area information to individual institutions to assist them in conducting internal program improvement efforts. Data will also be collected and reported separately on students participating in noncredit programs and on students participating in Tech-Prep programs.

Academic and Vocational and Technical Skill Proficiencies:

Performance Goal: To increase the number of vocational and technical education students who attain challenging academic and vocational and technical skill proficiencies.

Core Indicator

- The state will increase the percentage of students earning a grade of "C" or better in vocational and technical education courses.

Level of Performance: The state will initially institute a 76.49% level of performance for successful skill attainment (grade of "C" or better) for students enrolling in vocational and technical education courses. The level of performance will be re-evaluated in early 2001 and renegotiated with USDE for the 2000-2001 program year and performance levels will be determined for the 2001-2002 through 2003-2004 program years. While skill attainment rates for special populations will be delineated in statewide reports, all special population students are expected to perform at the statewide performance level.

Estimates indicate that over the next few years, academic preparation and readiness of freshmen entering the state's colleges will be at a lower level. Community colleges will be challenged to prepare these academically disadvantaged students in order that they may succeed in vocational and technical education programs. Meeting and exceeding the negotiated levels of performance will require significant effort on the part of the colleges.

Community college districts and colleges will attempt to attain the 76.49% successful skill attainment rate for vocational programs in the first year and the negotiated and agree-upon levels for the years through 2003-2004. Programs that are below the performance level will be identified and that information will be provided to the districts and colleges. Skill attainment rates for special populations will be delineated for all programs so local institution staff can target efforts where they are most severely needed. Staff development in teaching and working with student populations will help address this challenge. Special population groups falling below the performance level will be identified within the program delineations.

Completion:

Performance Goal: To increase the percentage of students who meet a minimum course work threshold level and who transfer or receive a postsecondary degree, certificate, or equivalent.

Core Indicator

- The state will increase the percentage of leavers and completers who have successfully completed a minimum "threshold of 12 or more units of related course work" in a vocational or technical program area and who: 1) receive a degree, certificate, or equivalent; 2) transfer to a four-year educational institution; or 3) enlist in the military.

Level of Performance: Statewide, the previous year's vocational and technical education leaver and completer cohort will have a 60.55% completion rate. California will institute a

local performance level of 60.55% completion. Local reports will identify program areas and special populations within program areas at each college that fall below the 60.55% completion level so that efforts can be focused on bringing all populations in vocational and technical programs above that level.

Placement in Postsecondary Education, Employment, or the Military:

Performance Goal: To increase the percentage of program leavers and completers who transfer to four-year postsecondary institutions, who find employment, or who enter the military.

Core Indicator

- The state will increase the percentage of vocational and technical education program leavers and completers who were found during one of the four quarters following the cohort year in unemployment insurance (UI) covered employment, the Federal Government, the military, or a four-year educational institution.

Level of Performance: Statewide, student leavers and completers will have a placement rate adjusted by economic indicators of at least 85.89%. Those districts and colleges in which placement performance levels in vocational and technical education programs and for special populations within the programs fall below the 85.89% rate will be identified in order that efforts may be directed toward improving placement outcomes.

Retention in Employment:

Performance Goal: To increase the percentage of program leavers and completers who are retained in employment.

Core Indicator

- The state will increase the percentage of vocational and technical education program leavers and completers who were found in UI-covered employment during one of the four quarters after the cohort year and were not federal employees, in the military, or continuing their education at another college, who had three or more consecutive quarters of employment.

Level of Performance: Although not required for the 1999-2000 federal Consolidated Annual Report, the state will implement a level such that statewide, at least 84.53% of the cohort found exclusively in UI-covered employment will be found in three or more consecutive quarters.

District and college vocational and technical education programs and special populations within the programs that are below the 84.53% rate will be identified.

Nontraditional Participation and Completion:

Performance Goal: To increase the rates of participation and completion of underrepresented males and females in vocational and technical education programs preparing students for

high-skill, high-wage occupations in which one gender constitutes less than 25% of those employed. (A high-skill, high-wage job is defined as one with starting average earnings above 2080 hours multiplied by twice the minimum hourly wage.)

Core Indicators

- The state will increase the percentage of females participating in vocational and technical education course work leading to employment in male-dominated high-skill, high-wage occupations and males participating in vocational and technical education course work leading to employment in female-dominated occupations associated with high-skill, high-wage occupations.
- The state will increase the percentage of female students in programs leading to male-dominated high-skill, high-wage occupations and male students in programs leading to female-dominated high-skill, high-wage occupations who: 1) receive a degree, certificate, or equivalent; 2) transfer to four-year institutions; or 3) enlist in the military.

Level of Performance: The state will focus on three components of the nontraditional indicator:

Component 1: For programs leading to employment in nontraditional occupations, the percentage of the nontraditional gender in enrollments will be at least 26.46%. District and college levels will be set such that programs and special populations within program areas will be identified that are below this rate.

Component 2: For programs leading to employment in nontraditional occupations, the percentage of the nontraditional gender in completions will be at least 27.54%. District and college levels will be set such that programs and special populations within program areas will be identified that are below this rates.

Component 3: The purpose of this component is to examine the relationship between participation and completion. Completion rates of programs identified as nontraditional should be similar to or higher than the participation rates in those programs. Completion rates equal to or higher than participation rates may suggest that no artificial barriers exist within the program structure. District and college levels will be set such that programs and special populations within program areas will be identified that are below these rates.

County Workforce: A Snapshot

Oakland Metropolitan Statistical Area (MSA): Alameda and Contra Costa Counties

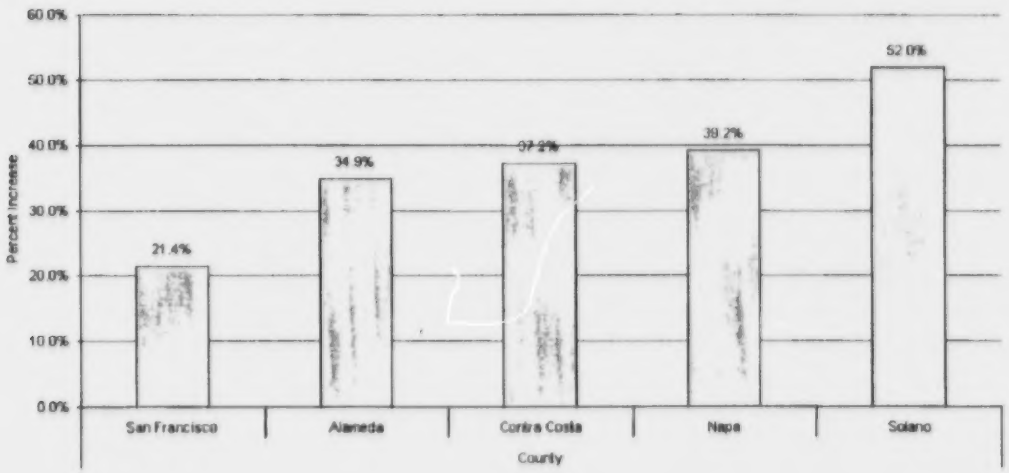
The unemployment rate in the Oakland MSA was 5.6% in January 2002, up from a revised 4.7% in December 2001, and above the year-ago estimate of 2.8%. This compares with an unadjusted unemployment rate of 6.7% for California and 6.3% for the nation during the same period. The unemployment rate was 6.3% in Alameda County and 4.6% in Contra Costa County.

The total number of wage and salary workers in Alameda and Contra Costa counties was estimated to be 1,051,800 in January 2002, down by 12,100 from the December 2001 total. Seasonal factors and weather changes resulted in cutbacks in most industry groups. Over one-third of the job reductions occurred in retail trade (down 4,900 jobs) with the lay-off of holiday sales staff. Construction declined by 2,000 jobs due to inclement weather. Government employment slipped seasonally by 1,800 jobs because of the winter recess of state colleges, universities and community colleges as well as a shrinkage of temporary postal-worker jobs. Services also dropped by 1,800 jobs, primarily in business services. A transportation and public utilities reduction of 1,000 jobs was concentrated in air transportation because of layoffs of temporary package-shipping workers. Wholesale trade and manufacturing posted losses of 300 jobs each and finance, insurance and real estate fell by 100 jobs. Mining remained unchanged over the year, while farming registered 100 additional jobs.

Compared with January of 2001, employment totals in January 2002 dipped slightly by 1,600 jobs (down 0.2%). Manufacturing companies reported losses of 9,000 jobs primarily in electronic equipment and industrial machinery. A drop of 2,400 jobs in transportation and public utilities was centered in air transportation and trucking. Wholesale trade shrunk by 1,400 jobs. On the other hand, payrolls moved up by 5,200 jobs in government with nearly two-thirds of the growth in state and local education. Finance, insurance and real estate gained by 2,700 jobs, while services employment improved by 1,300 jobs with gains in most services sectors offsetting losses in business services. Farming, retail trade and construction edged upward by 700, 600, and 500 jobs respectively, while mining expanded by 200 jobs.

NOTE: Labor Force and Industry data contained in this release may differ from previous information due to the U.S. Department of Labor's annual revision process.

Figure 5. Projected Jobs Growth for Select Counties
Percent Increase Expected by 2025 over 2000 Baseline



Source: Office of District Research, Contra Costa CCD. March 2002. Based on Association of Bay Area Government (ABAG) Projections 2002 report.

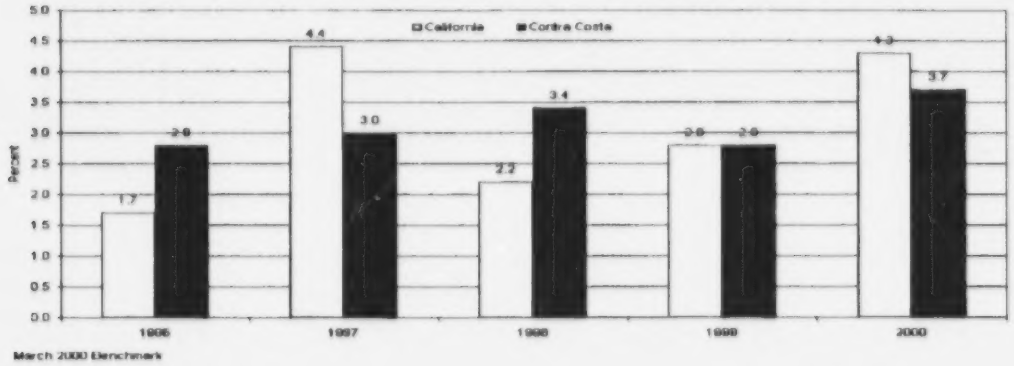
Comments/Analysis:

As can be seen in Figure 5, the projected job growth of Contra Costa County compares favorably with surrounding counties except Solano which shows a 52% over its relatively small 2000 job base.

Industry Employment

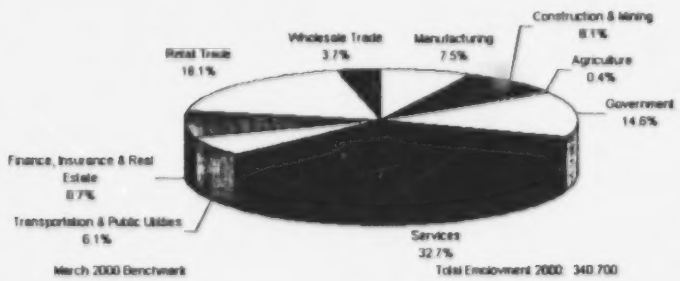
Job growth creates opportunity and is considered to be one measure of economic health. From 1996 to 2000, Contra Costa County's wage and salary employment added 43,000 jobs, a cumulative growth of 14.4%. In 2000, payroll employment grew by 14,100 jobs. The largest concentration of new jobs was in the services industry, which increased by 7,000 new jobs or 6.6%.

Figure 6. Percent Change in Total Employment



In 2000, services, retail trade, and government sectors dominated Contra Costa employment. Together these three industries accounted for 65.4% (222,818) of the total employment (370,700) in the county. Other industries which also increased their share of Contra Costa's total employment during 1999 included construction, manufacturing, wholesale trade, transportation and public utilities, and agriculture. Industry projections for 1997-2004 nonfarm employment forecast that 75% of the job growth during the seven-year period will also be in services, retail trade, and government.

Figure 7. Contra Costa County Employment by Industry 2000 Annual Average



Source: Office of District Research, Contra Costa CCD. March 2002. Adapted from EDD Labor Market report: County Snapshot, Contra Costa 2001.

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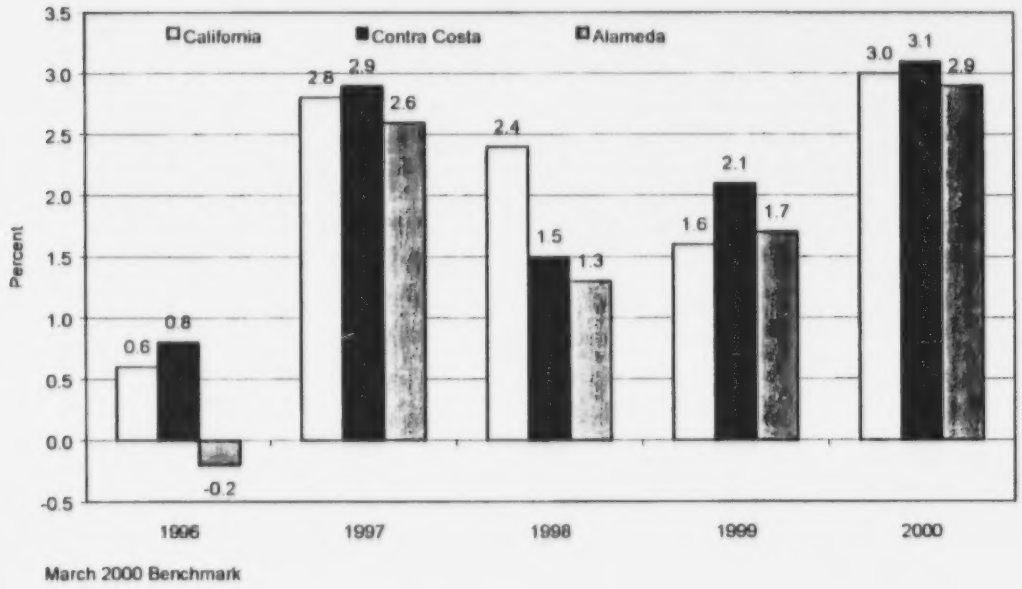
Labor Force

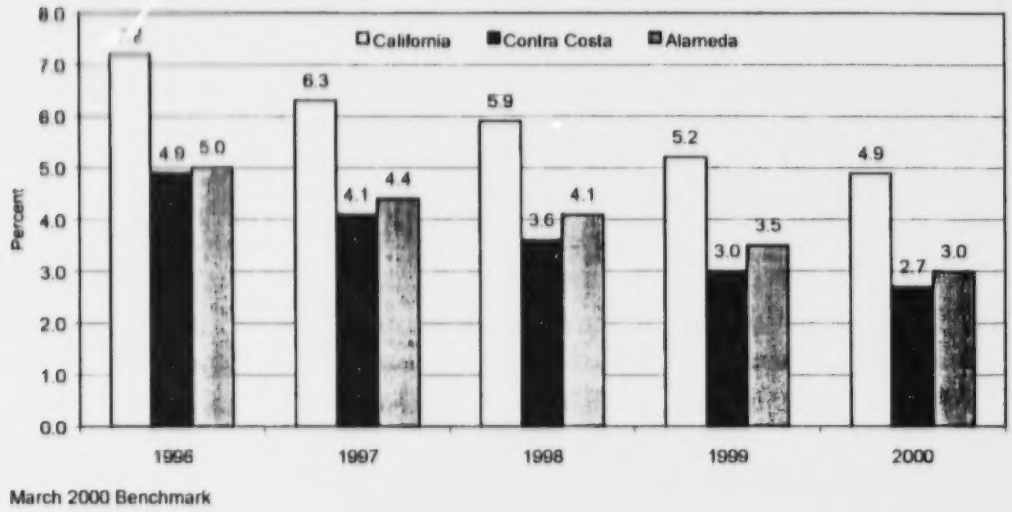
Each year for the 1996-2000 period, Contra Costa County sustained growth in the civilian labor force each year, recording a high 3.1% in the year 2000. This surpassed the state's rate of growth, 3.0%, for the same year. Over this period, Contra Costa County's labor force grew from 459,500 in 1996 to 505,100 in 2000, a cumulative increase of 45,600 or 9.9%. This compares to a cumulative growth of 10.2% for the state and 8.7% for neighboring Alameda County.

Figure 8. Percent Change in Labor Force



Since 1996, unemployment rates are lower for Contra Costa and neighboring Alameda County than for the state, indicative of the employment opportunities in that area. From 1996 to 2000, Contra Costa County's annual average unemployment rate dropped by 2.2%, from a high of 4.0% in 1996 to 2.7% in 2000. The greatest year-to-year decline occurred in 1997 when the rate fell by 0.8%. For 2000, the annual average unemployment rate was down by 0.3% from the previous year. California and Alameda experienced a similar pattern of decline in unemployment.

Figure 9. Unemployment Rate



Source: Office of District Research, Contra Costa CCD. March 2002. Adapted from EDD Labor Market report: County Snapshot, Contra Costa 2001.

Table 18, on the following page, lists EDD projections by Industry sector for 1997-2004. As displayed, total nonfarm jobs (the sum of goods and service producing sectors) will increase from 309,700 to 364,100 for an absolute change of 54,000 or 17.6%. The absolute increase in job totals for the nonfarm service producing sector will be substantially greater than that for the goods producing sector (46,800 vs. 7,500 respectively) even though the percent increase in jobs for these sectors are roughly comparable (17.9% vs. 15.6%). For the nonfarm goods producing sector, the largest increase will come from construction (4,500) and manufacturing (2,700). For the service producing sector, the largest number of new jobs will come from business (9,000) and health services (6,300), retail trade (7,600), and local government (7,000).

Table 18. Employment Projections by Industry, 1997-2004
Contra Costa County

Industry	Annual Averages (1) 1997(2)	2004	Absolute Change	Percent Change
TOTAL NONFARM	**309,700**	**364,100**	**54,400**	**17.6%**
GOODS PRODUCING	**48,100**	**55,600**	**7,500**	**15.6%**
MINING	**1,700**	**2,000**	**300**	**17.6%**
CONSTRUCTION	**20,400**	**24,900**	**4,500**	**22.1%**
General Building Contractors	5,400	6,700	1,300	24.1%
Heavy Construction	3,800	4,100	300	7.9%
Special Trade	11,200	14,100	2,900	25.9%
MANUFACTURING	**26,000**	**28,700**	**2,700**	**10.4%**
Durable Goods	8,900	11,100	2,200	24.7%
Lumber, Wood, & Furniture	600	700	100	16.7%
Stone, Clay, & Glass	500	700	200	40.0%
Primary & Fabricated Metal	2,400	2,600	200	8.3%
Industrial Machinery	800	900	100	12.5%
Computer & Office Equipment	200	200	0	0.0%
Other Industrial Machinery	600	700	100	16.7%
Electronic Equipment	1,600	2,600	1,000	62.5%
Communications Equipment, Electronic Components	800	1,900	1,100	137.5%
Other Electronic Equipment	800	700	-100	-12.5%
Transportation Equipment	400	700	300	75.0%
Other Transportation Equipment	400	700	300	75.0%
Instruments & Related Products	2,300	2,600	300	13.0%
Miscellaneous Manufacturing	200	300	100	50.0%
Nondurable Goods	17,000	17,600	600	3.5%
Food & Kindred Products	1,800	1,800	0	0.0%
Paper & Allied Products	600	700	100	16.7%
Printing & Publishing	2,900	3,100	200	6.9%
Chemicals & Allied Products	4,000	3,400	-600	-15.0%
Petroleum & Coal Products	7,100	7,800	700	9.9%
Other Nondurable Goods	600	800	200	33.3%
SERVICE PRODUCING	**261,600**	**308,400**	**46,800**	**17.9%**
TRANSPORTATION & PUBLIC UTILITIES	**20,400**	**22,500**	**2,100**	**10.3%**
Transportation	7,600	8,300	700	9.2%
Trucking & Warehousing	2,500	2,700	200	8.0%
Water Transportation	700	700	0	0.0%

continued

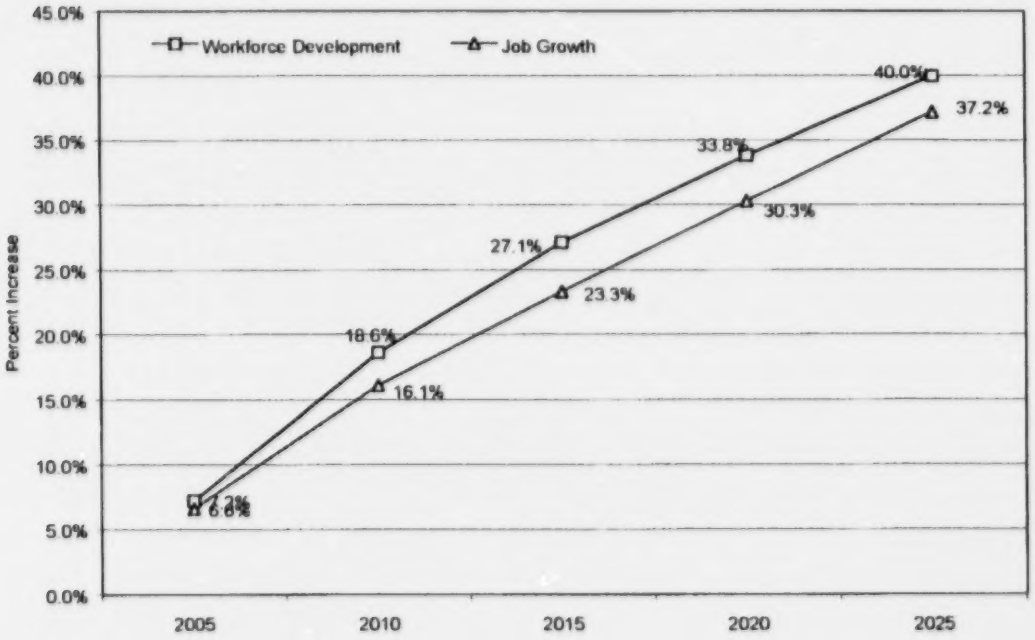
Employment Projections by Industry, 1997-2004 (cont.)

Industry	Annual Averages (1) 1997(2)	2004	Absolute Change	Percent Change
Other Transportation	4,600	4,900	300	6.5%
Communications & Public Utilities	12,800	14,200	1,400	10.9%
Communications	9,900	10,900	1,000	10.1%
Electric, Gas & Sanitary Services	3,000	3,300	300	10.0%
TRADE	**68,700**	**77,400**	**8,700**	**12.7%**
Wholesale Trade	11,300	12,400	1,100	9.7%
Wholesale--Durable	6,900	7,500	600	8.7%
Wholesale--Nondurable	4,400	4,900	500	11.4%
Retail Trade	57,400	65,000	7,600	13.2%
General Merchandise	6,600	7,200	600	9.1%
Food Stores	8,300	9,000	700	8.4%
Automotive Dealers & Service	5,500	6,100	600	10.9%
Eating & Drinking Places	19,300	22,300	3,000	15.5%
Other Retail Trade	17,600	20,400	2,800	15.9%
FINANCE, INSURANCE & REAL ESTATE	**27,900**	**31,000**	**3,100**	**11.1%**
Finance	15,500	17,300	1,800	11.6%
Other Finance, Insurance & Real Estate	12,400	13,700	1,300	10.5%
SERVICES	**98,900**	**124,900**	**26,000**	**26.3%**
Hotels & Other Lodging Places	2,100	2,500	400	19.0%
Personal Services	3,000	3,700	700	23.3%
Business Services	28,500	37,500	9,000	31.6%
Health Services	22,600	28,900	6,300	27.9%
Private Educational Services	4,400	4,900	500	11.4%
Engineering & Management	11,000	13,500	2,500	22.7%
Other Services	27,300	33,900	6,600	24.2%
GOVERNMENT	**45,600**	**52,600**	**7,000**	**15.4%**
Federal Government	6,400	6,600	200	3.1%
State & Local Government	39,200	46,000	6,800	17.3%
State Government	900	1,400	500	55.6%
Local Government	38,300	44,600	6,300	16.4%
Local Education	22,000	27,300	5,300	24.1%
Local Noneducation	16,300	17,300	1,000	6.1%

1. Employment and projections contained in these tables are considered estimates. Employment is reported by place of work and excludes self-employed persons, unpaid family workers, domestics, volunteers and those involved in labor-management trade disputes. These data are based on 1987 Standard Industrial Classifications. Annual average industry detail may not add up to totals due to independent rounding. Government data include all civilian government employees regardless of the activities in which they are engaged.
2. March 1998 benchmark.

Source: Office of District Research, Contra Costa CCD. March 2002. Adapted from EDD Labor Market report: "Projections and Planning Information," Module D, Table 2, County Snapshot, Contra Costa 2001.

Figure 10. Contra Costa County Projected Jobs vs. Workforce Growth Percent Increase Expected by 2025 over 2000 Baseline



Source: Office of District Research, Contra Costa CCD. March 2002. Based on Association of Bay Area Government (ABAG) Projections 2002 report.

Comments/Analysis:

This figure plots forecasted workforce development (the forecasted number of employed residents) and job growth figures that are detailed for the county on Tables 19 and 20. As can be seen, there will be more employed residents than there are jobs in the county. This suggests that many residents will be working outside of the county. This trend means that there will be a continuation of or an increase of congestion in the usual traffic corridors.

As mentioned, Tables 19 and 20 show in greater detail from where the number of projected jobs and employed residents will be coming.

Table 21 displays forecasted job growth by business sector and residential areas for the 2000-2010 horizon. As can be seen, the greatest job growth in absolute terms will occur in Concord, Walnut Creek, and San Ramon, and the largest job growth in percentage terms will occur in eastern part of the county. As noted earlier, the service sector will produce the largest number of jobs.

Listed on Tables 22-25 are Occupations with the greatest job growth, fastest growth, most openings, and most declines. Many of the occupations showing growth in absolute or percentage terms require various levels of on-the-job training, an AA/AS or BA/BS degree. Whichever of these requirements a student needs to meet, he or she can increase his or her odds of getting the desired job or moving toward the advance degree by taking relevant coursework at CCC, DVC, or LMC. This training, of course, need not be limited to the Voc. Ed. curriculum. It can entail courses from all relevant disciplines and vary from basic skills to pre-college to college level instruction.

As can be seen in Table 26, there are many jobs openings that are moderately or very difficulty (MVD) to fill with either inexperienced (IA) or (EA) experienced applicants. Clearly, these are just the type of positions for which CCCCD colleges can help potential applicants prepare. As noted, some of the colleges are already doing this in select occupational areas.

Table 19. Contra Costa County -Total Jobs

Location	2000	2005	2010	2015	2020	2025	% Chg. 2000-2025
ANTIOCH**	17,060	18,190	21,400	24,950	27,300	29,850	75.0%
BRENTWOOD**	5,260	5,590	6,890	8,750	11,120	13,280	152.5%
CLAYTON**	1,220	1,240	1,280	1,320	1,400	1,500	23.0%
CONCORD**	63,060	66,370	70,020	73,930	77,140	82,190	30.3%
DANVILLE**	10,150	10,820	11,880	12,120	12,550	13,480	32.8%
EL CERRITO**	8,020	8,170	8,540	8,670	8,820	9,170	14.3%
HERCULES**	3,190	3,430	4,080	4,390	4,710	5,050	58.3%
LAFAYETTE**	9,530	9,710	10,290	10,520	10,980	11,510	20.8%
MARTINEZ**	20,910	22,370	24,230	24,750	25,770	26,820	28.3%
MORAGA**	4,360	4,430	4,690	4,910	5,000	5,090	16.7%
OAKLEY**	3,920	4,260	5,420	6,930	8,890	10,990	180.4%
ORINDA**	4,860	5,030	5,320	5,430	5,610	5,710	17.5%
PINOLE**	5,980	6,110	6,470	6,730	7,310	7,840	31.1%
PITTSBURG**	19,490	21,260	23,830	24,940	27,030	28,870	48.1%
PLEASANT HILL**	17,650	18,450	19,340	19,510	20,320	21,170	19.9%
RICHMOND**	47,420	52,390	55,880	58,400	61,090	63,620	34.2%
SAN PABLO**	7,900	8,460	8,930	9,390	9,570	9,700	22.8%
SAN RAMON****	38,140	42,140	48,950	53,980	57,530	59,150	55.1%
WALNUT CREEK**	61,240	64,180	67,820	70,200	72,080	73,420	19.9%
ALAMO-BLACKHAWK****	5,270	5,440	5,560	5,570	5,740	5,900	12.0%
RODEO-CROCKETT****	3,320	3,590	3,950	4,130	4,310	4,590	38.3%
RURAL EAST C. C. CO.****	2,250	2,450	3,360	4,600	5,120	5,450	142.2%
REMAINDER	910	970	1,010	1,020	1,090	1,110	22.0%
CONTRA COSTA COUNTY	**361,110**	**385,050**	**419,140**	**445,140**	**470,480**	**495,460**	**37.2%**

*CITY **CITY SPHERE OF INFLUENCE ***URBAN SERVICE AREA
****OTHER SUBREGIONAL AREA

Source: Office of District Research, Contra Costa CCD. March 2002. Based on Association of Bay Area Governments (ABAG) Projections 2002.

Table 20. Contra Costa County - Employed Residents

Location	2000	2005	2010	2015	2020	2025	% Chg. 2000-2025
ANTIOCH**	43,811	45,700	51,700	55,900	59,800	62,500	42.7%
BRENTWOOD**	11,080	14,200	18,000	21,600	24,500	27,100	144.6%
CLAYTON**	5,725	6,100	6,600	7,000	7,500	8,000	39.7%
CONCORD**	68,412	71,900	76,800	80,500	82,700	85,300	24.7%
DANVILLE**	23,689	24,600	26,100	27,100	27,600	28,300	19.5%
EL CERRITO**	15,178	15,700	16,500	16,900	17,200	17,500	15.3%
HERCULES**	10,939	11,800	13,200	14,200	15,200	16,100	47.2%
LAFAYETTE**	14,220	14,900	15,900	16,500	17,100	17,800	25.2%
MARTINEZ**	23,008	23,400	25,200	26,500	27,200	28,000	21.7%
MORAGA**	8,420	8,600	9,200	9,600	9,900	10,300	22.3%
OAKLEY**	12,167	14,500	16,600	18,400	19,800	21,000	72.6%
ORINDA**	8,707	8,900	9,500	9,900	10,300	10,700	22.9%
PINOLE**	15,736	15,600	16,600	17,300	17,800	18,200	15.7%
PITTSBURG**	35,421	38,900	45,200	51,300	56,100	59,100	66.9%
PLEASANT HILL**	23,257	24,500	26,600	27,600	28,200	28,900	24.3%
RICHMOND**	54,013	56,800	60,200	62,500	64,000	66,000	22.2%
SAN PABLO**	12,446	12,700	13,500	14,100	14,400	14,800	18.9%
SAN RAMON****	26,956	31,600	37,700	43,900	49,000	54,400	101.8%
WALNUT CREEK**	40,129	42,100	46,600	48,600	50,300	52,200	30.1%
ALAMO-BLACKHAWK****	11,958	13,200	14,000	14,800	15,300	15,800	32.1%
RODEO-CROCKETT****	5,649	6,200	6,700	7,000	7,300	7,500	32.8%
RURAL EAST C. C. CO.****	8,939	11,900	15,300	16,600	17,900	18,600	108.1%
REMAINDER	4,038	4,900	6,100	7,400	8,400	9,400	132.8%
CONTRA COSTA COUNTY	**483,898**	**518,700**	**573,800**	**615,200**	**647,500**	**677,500**	**40.0%**

*CITY **CITY SPHERE OF INFLUENCE ***URBAN SERVICE AREA
****OTHER SUBREGIONAL AREA

Source: Office of District Research, Contra Costa CCD. March 2002. Based on Association of Bay Area Governments (ABAG) Projections 2002.

Table 21. Employment Change in Contra Costa County Top Subregional Study Areas: 2000-2010

MANUFACTURING & WHOLESALE JOBS	2000-2010 CHANGE
CONCORD	1,800
RICHMOND	780
OAKLEY	620
PITTSBURG	600
SAN RAMON	550
WALNUT CREEK	500
MARTINEZ	420
DANVILLE	230
ANTIOCH	220
PLEASANT HILL	200
RODEO-CROCKETT	200
SAN PABLO	110
HERCULES	100
LAFAYETTE	90
RURAL EAST C. C. CO.	60
EL CERRITO	50
BRENTWOOD	40

RETAIL JOBS	2000-2010 CHANGE
WALNUT CREEK	1,090
ANTIOCH	920
RICHMOND	880
SAN RAMON	880
CONCORD	680
PITTSBURG	640
PLEASANT HILL	630
BRENTWOOD	410
MARTINEZ	380
LAFAYETTE	310
DANVILLE	270
SAN PABLO	260
EL CERRITO	250
PINOLE	220
ALAMO-BLACKHAWK	190
ORINDA	130
MORAGA	110

MANUFACTURING & WHOLESALE JOBS	2000-2010 PERCENTAGE CHANGE
RURAL EAST C. C. CO.	50%
OAKLEY	45%
DANVILLE	35%
SAN PABLO	33%
CONCORD	21%
BRENTWOOD	18%
MORAGA	18%
EL CERRITO	17%
PITTSBURG	15%
PINOLE	14%
PLEASANT HILL	14%
ANTIOCH	13%
MARTINEZ	13%
RODEO-CROCKETT	13%
ORINDA	13%
WALNUT CREEK	10%
LAFAYETTE	10%

RETAIL JOBS	2000-2010 PERCENTAGE CHANGE
OAKLEY	58%
RURAL EAST C. C. CO.	39%
BRENTWOOD	37%
HERCULES	26%
PITTSBURG	22%
SAN RAMON	19%
ANTIOCH	18%
MARTINEZ	17%
ALAMO-BLACKHAWK	17%
RODEO-CROCKETT	16%
PLEASANT HILL	14%
SAN PABLO	14%
RICHMOND	14%
DANVILLE	14%
CLAYTON	13%
PINOLE	13%
MORAGA	12%

continued

Employment Change in Contra Costa County
Top Subregional Study Areas: 2000-2010 (cont.)

SERVICE JOBS	2000-2010 CHANGE
SAN RAMON	4,860
WALNUT CREEK	4,140
RICHMOND	3,770
CONCORD	2,580
ANTIOCH	2,070
PITTSBURG	1,770
BRENTWOOD	1,150
MARTINEZ	990
PLEASANT HILL	810
DANVILLE	770
SAN PABLO	550
OAKLEY	440
RURAL EAST C. C. CO.	440
HERCULES	400
LAFAYETTE	310
ORINDA	260
PINOLE	210

OTHER JOBS	2000-2010 CHANGE
SAN RAMON	4,520
RICHMOND	3,030
CONCORD	1,900
MARTINEZ	1,530
PITTSBURG	1,330
ANTIOCH	1,130
WALNUT CREEK	850
RURAL EAST C. C. CO.	520
DANVILLE	460
OAKLEY	370
HERCULES	290
RODEO-CROCKETT	190
SAN PABLO	110
LAFAYETTE	50
MORAGA	50
PLEASANT HILL	50
PINOLE	40

SERVICE JOBS	2000-2010 PERCENTAGE CHANGE
REMAINDER	267%
RODEO-CROCKETT	68%
HERCULES	47%
RURAL EAST C. C. CO.	39%
BRENTWOOD	38%
OAKLEY	37%
SAN RAMON	36%
ANTIOCH	30%
PITTSBURG	26%
RICHMOND	22%
DANVILLE	18%
WALNUT CREEK	15%
MARTINEZ	13%
CONCORD	13%
SAN PABLO	12%
ORINDA	11%
PLEASANT HILL	10%

OTHER JOBS	2000-2010 PERCENTAGE CHANGE
RURAL EAST C. C. CO.	84%
SAN RAMON	35%
ANTIOCH	34%
HERCULES	31%
OAKLEY	30%
PITTSBURG	24%
RICHMOND	20%
MARTINEZ	19%
RODEO-CROCKETT	16%
DANVILLE	14%
SAN PABLO	9%
CONCORD	9%
MORAGA	7%
REMAINDER	5%
WALNUT CREEK	4%
PINOLE	4%
BRENTWOOD	4%

Source: Office of District Research, Contra Costa CCD. March 2002. Based on Association of Bay Area Governments (ABAG) Projections 2002.

Table 22. Contra Costa County Occupations With Greatest Job Growth, 1997-2004

CA OES Code	Occupation	Annual Averages 1997	2004	Absolute Change	Percent Change	Education/Experience (BLS Training Level)
31305	TEACHERS--ELEMENTARY SCHOOL	4,380	6,110	1,730	39.50%	BACHELOR'S DEGREE (5)
49011	SALESPERSONS, RETAIL	10,900	12,500	1,600	14.70%	SHORT-TERM ON-THE-JOB TRAINING (11)
19005	GENERAL MANAGERS, TOP EXECUTIVES	8,040	9,480	1,440	17.90%	Work Exp. Plus a Bachelor's or Higher
49023	CASHIERS	7,870	9,290	1,420	18.00%	SHORT-TERM ON-THE-JOB TRAINING (11)
55347	GENERAL OFFICE CLERKS	8,840	10,040	1,200	13.60%	SHORT-TERM ON-THE-JOB TRAINING (11)
25102	SYSTEMS ANALYSTS--ELECTRONIC DATA PROCESSING	2,160	3,290	1,130	52.30%	BACHELOR'S DEGREE (5)
25104	COMPUTER SUPPORT SPECIALISTS	2,370	3,490	1,120	47.30%	BACHELOR'S DEGREE (5)
87102	CARPENTERS	4,250	5,210	960	22.60%	LONG-TERM ON-THE-JOB TRAINING (9)
55305	RECEPTIONISTS, INFORMATION CLERKS	4,030	4,930	900	22.30%	SHORT-TERM ON-THE-JOB TRAINING (11)
32502	REGISTERED NURSES	4,130	4,980	850	20.60%	ASSOCIATE DEGREE (6)
79041	LABORERS, LANDSCAPING/GROUNDSKEEPING	3,410	4,240	830	24.30%	SHORT-TERM ON-THE-JOB TRAINING (11)
67005	JANITORS, CLEANERS--EXCEPT MAIDS	4,500	5,260	760	16.90%	SHORT-TERM ON-THE-JOB TRAINING (11)
31308	TEACHERS--SECONDARY SCHOOL	4,830	5,550	720	14.90%	BACHELOR'S DEGREE (5)
65008	WAITERS AND WAITRESSES	4,220	4,840	620	14.70%	SHORT-TERM ON-THE-JOB TRAINING (11)
22127	COMPUTER ENGINEERS	1,140	1,700	560	49.10%	BACHELOR'S DEGREE (5)
55108	SECRETARIES, GENERAL	5,830	6,390	560	9.60%	POST-SECONDARY VOCATIONAL EDUCATION (7)
66008	NURSE AIDES, ORDERLIES, ATTENDANTS	1,860	2,380	520	28.00%	SHORT-TERM ON-THE-JOB TRAINING (11)
97105	TRUCK DRIVERS, LIGHT	2,900	3,400	500	17.20%	SHORT-TERM ON-THE-JOB TRAINING (11)
98902	HAND PACKERS AND PACKAGERS	2,100	2,600	500	23.80%	SHORT-TERM ON-THE-JOB TRAINING (11)
13002	FINANCIAL MANAGERS	2,330	2,780	450	19.30%	WORK EXP. PLUS A BACHELOR'S OR HIGHER (4)
65041	COMBINED FOOD PREPARATION AND SERVICE	3,760	4,210	450	12.00%	SHORT-TERM ON-THE-JOB TRAINING (11)
68038	CHILD CARE WORKERS	1,220	1,650	430	35.20%	SHORT-TERM ON-THE-JOB TRAINING (11)
13017	ENGINEERING, MATHEMATICAL, AND NATURAL SCIENCE MGRS	1,280	1,690	410	32.00%	WORK EXP. PLUS A BACHELOR'S OR HIGHER (4)
25105	COMPUTER PROGRAMMERS	2,750	3,160	410	14.90%	BACHELOR'S DEGREE (5)
31303	TEACHERS, PRESCHOOL	1,370	1,780	410	29.90%	BACHELOR'S DEGREE (5)
53905	TEACHER AIDES & EDUCATIONAL ASSISTANTS, CLERICAL	1,270	1,670	400	31.50%	SHORT-TERM ON-THE-JOB TRAINING (11)
65038	FOOD PREPARATION WORKERS	2,840	3,220	380	13.40%	SHORT-TERM ON-THE-JOB TRAINING (11)
21114	ACCOUNTANTS AND AUDITORS	2,770	3,140	370	13.40%	BACHELOR'S DEGREE (5)

continued

Source: Office of District Research, Contra Costa CCD. March 2002. Based on California Employment Development Department, Labor Market Information 1997-2004.

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Contra Costa County
Occupations With Greatest Job Growth, 1997-2004 (cont.)

CA OES Code	Occupation	Annual Averages 1997	2004	Absolute Change	Percent Change	Education/Experience (BLS Training Level)
31304	TEACHERS, KINDERGARTEN	650	990	340	52.30%	BACHELOR'S DEGREE (5)
43014	SALES AGENTS--FINANCIAL SERVICES	730	1,070	340	46.60%	LONG-TERM ON-THE-JOB TRAINING (9)
65026	COOKS--RESTAURANT	1,980	2,320	340	17.20%	LONG-TERM ON-THE-JOB TRAINING (9)
63047	GUARDS AND WATCH GUARDS	1,840	2,170	330	17.90%	SHORT-TERM ON-THE-JOB TRAINING (11)
85302	AUTOMOTIVE MECHANICS	2,070	2,400	330	15.90%	LONG-TERM ON-THE-JOB TRAINING (9)
31311	TEACHERS--SPECIAL EDUCATION	880	1,180	300	34.10%	BACHELOR'S DEGREE (5)
66005	MEDICAL ASSISTANTS	900	1,200	300	33.30%	MODERATE-TERM ON-THE-JOB TRAINING (10)
53123	ADJUSTMENT CLERKS	1,480	1,760	280	18.90%	SHORT-TERM ON-THE-JOB TRAINING (11)
55338	BOOKKEEPING, ACCOUNTING CLERKS	4,530	4,810	280	6.20%	MODERATE-TERM ON-THE-JOB TRAINING (10)
97102	TRUCK DRIVERS, HEAVY	2,070	2,350	280	13.50%	SHORT-TERM ON-THE-JOB TRAINING (11)
85132	MAINTENANCE REPAIRERS, GENERAL UTILITY	2,480	2,750	270	10.90%	LONG-TERM ON-THE-JOB TRAINING (9)
31321	INSTRUCTORS AND COACHES--SPORTS	1,350	1,610	260	19.30%	MODERATE-TERM ON-THE-JOB TRAINING (10)
31521	TEACHER AIDES, PARAPROFESSIONAL	1,770	2,030	260	14.70%	ASSOCIATE DEGREE (6)
58023	STOCK CLERKS--STOCKROOM, WAREHOUSE	2,080	2,340	260	12.50%	SHORT-TERM ON-THE-JOB TRAINING (11)
63014	POLICE PATROL OFFICERS	1,320	1,580	260	19.70%	LONG-TERM ON-THE-JOB TRAINING (9)
87202	ELECTRICIANS	1,340	1,600	260	19.40%	LONG-TERM ON-THE-JOB TRAINING (9)
13011	MARKETING, ADVERTISING, PUBLIC RELATIONS MANAGERS	1,500	1,750	250	16.70%	WORK EXP. PLUS A BACHELOR'S OR HIGHER (4)
21108	LOAN OFFICERS AND COUNSELORS	940	1,190	250	26.60%	BACHELOR'S DEGREE (5)
49008	SALES REPRESENTATIVES, NON-SCIENTIFIC, EX RETAIL	2,140	2,390	250	11.70%	MODERATE-TERM ON-THE-JOB TRAINING (10)
49026	TELEMARKETERS, SOLICITORS & RELATED	740	990	250	33.80%	SHORT-TERM ON-THE-JOB TRAINING (11)
67002	MAIDS AND HOUSEKEEPING CLEANERS	1,440	1,690	250	17.40%	SHORT-TERM ON-THE-JOB TRAINING (11)
87402	PAINTERS, PAPERHANGERS--CONSTRUCTION	960	1,210	250	26.00%	MODERATE-TERM ON-THE-JOB TRAINING (10)
	TOTAL OF THESE OCCUPATIONS	**142,540**	**170,360**	**27,820**	**19.50%**	

(1) Excludes not elsewhere classified (NEC) categories and occupations with employment of less than 200 in 2004.

Source: Office of District Research, Contra Costa CCD. March 2002. Based on California Employment Development Department, Labor Market Information 1997-2004.

Table 23. Contra Costa County - Occupations With the Fastest Growth 1997-2004

CA OES Code	Occupation	Annual Averages 1997	2004	Absolute Change	Percent Change	Education/Experience (BLS Training Level)
25102	SYSTEMS ANALYSTS--ELECTRONIC DATA PROCESSING	2,160	3,290	1,130	52.30%	BACHELOR'S DEGREE (5)
31304	TEACHERS, KINDERGARTEN	650	990	340	52.30%	BACHELOR'S DEGREE (5)
22127	COMPUTER ENGINEERS	1,140	1,700	560	49.10%	BACHELOR'S DEGREE (5)
25104	COMPUTER SUPPORT SPECIALISTS	2,370	3,490	1,120	47.30%	BACHELOR'S DEGREE (5)
43014	SALES AGENTS--FINANCIAL SERVICES	730	1,070	340	46.60%	LONG-TERM ON-THE-JOB TRAINING (9)
27308	HUMAN SERVICES WORKERS	350	510	160	45.70%	MODERATE-TERM ON-THE-JOB TRAINING (10)
66011	HOME HEALTH CARE WORKERS	380	540	160	42.10%	SHORT-TERM ON-THE-JOB TRAINING (11)
31305	TEACHERS--ELEMENTARY SCHOOL	4,380	6,110	1,730	39.50%	BACHELOR'S DEGREE (5)
68035	PERSONAL AND HOME CARE AIDES	290	400	110	37.90%	SHORT-TERM ON-THE-JOB TRAINING (11)
53128	BROKERAGE CLERKS	220	300	80	36.40%	SHORT-TERM ON-THE-JOB TRAINING (11)
15008	MEDICINE, HEALTH SERVICES MGRS	530	720	190	35.80%	WORK EXP. PLUS A BACHELOR'S OR HIGHER (4)
32302	RESPIRATORY CARE PRACTITIONERS	170	230	60	35.30%	ASSOCIATE DEGREE (6)
68038	CHILD CARE WORKERS	1,220	1,650	430	35.20%	SHORT-TERM ON-THE-JOB TRAINING (11)
31311	TEACHERS--SPECIAL EDUCATION	880	1,180	300	34.10%	BACHELOR'S DEGREE (5)
27307	RESIDENTIAL COUNSELORS	470	630	160	34.00%	BACHELOR'S DEGREE (5)
49026	TELEMARKETERS, SOLICITORS & RELATED	740	990	250	33.80%	SHORT-TERM ON-THE-JOB TRAINING (11)
66005	MEDICAL ASSISTANTS	900	1,200	300	33.30%	MODERATE-TERM ON-THE-JOB TRAINING (10)
87317	PLASTERERS AND STUCCO MASONS	210	280	70	33.30%	LONG-TERM ON-THE-JOB TRAINING (9)
87302	BRICK MASONS	180	240	60	33.30%	LONG-TERM ON-THE-JOB TRAINING (9)
97114	TAXI DRIVERS AND CHAUFFEURS	180	240	60	33.30%	SHORT-TERM ON-THE-JOB TRAINING (11)
22128	INDUSTRIAL ENGINEERS--EXCEPT SAFETY	150	200	50	33.30%	BACHELOR'S DEGREE (5)
13017	ENGINEERING, MATHEMATICAL, AND NATURAL SCIENCE MGRS	1,280	1,690	410	32.00%	WORK EXP. PLUS A BACHELOR'S OR HIGHER (4)

continued

Contra Costa County - Occupations With the Fastest Growth 1997-2004 (cont.)

CA OES Code	Occupation	Annual Averages 1997	2004	Absolute Change	Percent Change	Education/Experience (BLS Training Level)
31514	VOCATIONAL & EDUCATIONAL COUNSELORS	410	540	130	31.70%	MASTER'S DEGREE (3)
53905	TEACHER AIDES & EDUCATIONAL ASSISTANTS, CLERICAL	1,270	1,670	400	31.50%	SHORT-TERM ON-THE-JOB TRAINING (11)
89132	SHEET METAL WORKERS	510	670	160	31.40%	MODERATE-TERM ON-THE-JOB TRAINING (10)
21117	BUDGET ANALYSTS	160	210	50	31.30%	BACHELOR'S DEGREE (5)
31303	TEACHERS, PRESCHOOL	1,370	1,780	410	29.90%	BACHELOR'S DEGREE (5)
27305	SOCIAL WORKERS--EX MEDICAL, PSYCHIATRIC	670	870	200	29.90%	BACHELOR'S DEGREE (5)
22135	MECHANICAL ENGINEERS	370	480	110	29.70%	BACHELOR'S DEGREE (5)
55332	INTERVIEW CLERKS--EX PERSONNEL, WELFARE	450	580	130	28.90%	SHORT-TERM ON-THE-JOB TRAINING (11)
13005	PERSONNEL, TRAINING, LABOR RELATIONS MGRS	700	900	200	28.60%	WORK EXP, PLUS A BACHELOR'S OR HIGHER (4)
21902	COST ESTIMATORS	460	590	130	28.30%	WORK EXPERIENCE (8)
66008	NURSE AIDES, ORDERLIES, ATTENDANTS	1,860	2,380	520	28.00%	SHORT-TERM ON-THE-JOB TRAINING (11)
98312	HELPERS--CARPENTERS AND RELATED	360	460	100	27.80%	SHORT-TERM ON-THE-JOB TRAINING (11)
49034	DEMONSTRATORS AND PROMOTERS	220	280	60	27.30%	MODERATE-TERM ON-THE-JOB TRAINING (10)
21108	LOAN OFFICERS AND COUNSELORS	940	1,190	250	26.60%	BACHELOR'S DEGREE (5)
32308	PHYSICAL THERAPISTS	340	430	90	26.50%	BACHELOR'S DEGREE (5)
25103	DATA BASE ADMINISTRATORS	530	670	140	26.40%	BACHELOR'S DEGREE (5)
22126	ELECTRICAL AND ELECTRONIC ENGINEERS	800	1,010	210	26.30%	BACHELOR'S DEGREE (5)
53508	BILL AND ACCOUNT COLLECTORS	760	960	200	26.30%	SHORT-TERM ON-THE-JOB TRAINING (11)
87402	PAINTERS, PAPERHANGERS--CONSTRUCTION	960	1,210	250	26.00%	MODERATE-TERM ON-THE-JOB TRAINING (10)
32102	PHYSICIANS AND SURGEONS	830	1,040	210	25.30%	FIRST PROFESSIONAL DEGREE (1)
53121	LOAN AND CREDIT CLERKS	750	940	190	25.30%	SHORT-TERM ON-THE-JOB TRAINING (11)
87602	CARPET INSTALLERS	200	250	50	25.00%	MODERATE-TERM ON-THE-JOB TRAINING (10)
92726	LAUNDRY, DRYCLEANING MACHINE OPERATORS--EX PRESSING	200	250	50	25.00%	MODERATE-TERM ON-THE-JOB TRAINING (10)
89311	CABINETMAKERS AND BENCH CARPENTERS	160	200	40	25.00%	LONG-TERM ON-THE-JOB TRAINING (9)
98311	HELPERS--BRICK, STONE MASONS	160	200	40	25.00%	SHORT-TERM ON-THE-JOB TRAINING (11)
79041	LABORERS, LANDSCAPING/GROUNDSKEEPING	3,410	4,240	830	24.30%	SHORT-TERM ON-THE-JOB TRAINING (11)
87108	DRYWALL INSTALLERS	330	410	80	24.20%	MODERATE-TERM ON-THE-JOB TRAINING (10)
81005	FIRST-LINE SUPERVISORS/MANAGERS--CONSTRUCTION	830	1,030	200	24.10%	WORK EXPERIENCE (8)
	TOTAL OF THESE OCCUPATIONS	39,590	53,090	13,500	34.10%	

(1) Excludes not elsewhere classified (NEC) categories and occupations with employment of less than 200 in 2004.

Source: Office of District Research, Contra Costa CCD. March 2002. Based on California Employment Development Department, Labor Market Information 1997-2004.

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Table 24. Contra Costa County - Occupations With the Most Openings, 1997-2004

California OES Code	Occupation	Number of Job Openings 1997-2004	Education/Experience (BLS Training Level)
49011	SALESPERSONS, RETAIL	4,520	SHORT-TERM ON-THE-JOB TRAINING (11)
49023	CASHIERS	4,370	SHORT-TERM ON-THE-JOB TRAINING (11)
55347	GENERAL OFFICE CLERKS	3,070	SHORT-TERM ON-THE-JOB TRAINING (11)
31305	TEACHERS--ELEMENTARY SCHOOL	2,530	BACHELOR'S DEGREE (5)
19005	GENERAL MANAGERS, TOP EXECUTIVES	2,470	WORK EXP. PLUS A BACHELOR'S OR HIGHER (4)
65008	WAITERS AND WAITRESSES	2,430	SHORT-TERM ON-THE-JOB TRAINING (11)
65041	COMBINED FOOD PREPARATION AND SERVICE	2,040	SHORT-TERM ON-THE-JOB TRAINING (11)
31308	TEACHERS--SECONDARY SCHOOL	1,850	BACHELOR'S DEGREE (5)
87102	CARPENTERS	1,840	LONG-TERM ON-THE-JOB TRAINING (9)
79041	LABORERS, LANDSCAPING/GROUNDSKEEPING	1,660	SHORT-TERM ON-THE-JOB TRAINING (11)
65038	FOOD PREPARATION WORKERS	1,590	SHORT-TERM ON-THE-JOB TRAINING (11)
55305	RECEPTIONISTS, INFORMATION CLERKS	1,520	SHORT-TERM ON-THE-JOB TRAINING (11)
67005	JANITORS, CLEANERS--EXCEPT MAIDS	1,520	SHORT-TERM ON-THE-JOB TRAINING (11)
32502	REGISTERED NURSES	1,350	ASSOCIATE DEGREE (6)
25102	SYSTEMS ANALYSTS--ELECTRONIC DATA PROCESSING	1,230	BACHELOR'S DEGREE (5)
25104	COMPUTER SUPPORT SPECIALISTS	1,230	BACHELOR'S DEGREE (5)
55108	SECRETARIES, GENERAL	1,230	POST-SECONDARY VOCATIONAL EDUCATION (7)
25105	COMPUTER PROGRAMMERS	1,040	BACHELOR'S DEGREE (5)
98902	HAND PACKERS AND PACKAGERS	910	SHORT-TERM ON-THE-JOB TRAINING (11)
55338	BOOKKEEPING, ACCOUNTING CLERKS	880	MODERATE-TERM ON-THE-JOB TRAINING (10)
65017	COUNTER ATTENDANTS--FOOD	860	SHORT-TERM ON-THE-JOB TRAINING (11)
97105	TRUCK DRIVERS, LIGHT	800	SHORT-TERM ON-THE-JOB TRAINING (11)
65026	COOKS--RESTAURANT	770	LONG-TERM ON-THE-JOB TRAINING (9)
13002	FINANCIAL MANAGERS	720	WORK EXP. PLUS A BACHELOR'S OR HIGHER (4)
66008	NURSE AIDES, ORDERLIES, ATTENDANTS	720	SHORT-TERM ON-THE-JOB TRAINING (11)
85302	AUTOMOTIVE MECHANICS	720	LONG-TERM ON-THE-JOB TRAINING (9)
63047	GUARDS AND WATCH GUARDS	690	SHORT-TERM ON-THE-JOB TRAINING (11)
21114	ACCOUNTANTS AND AUDITORS	680	BACHELOR'S DEGREE (5)
85132	MAINTENANCE REPAIRERS, GENERAL UTILITY	680	LONG-TERM ON-THE-JOB TRAINING (9)
31303	TEACHERS, PRESCHOOL	640	BACHELOR'S DEGREE (5)

continued

Contra Costa County - Occupations With the Most Openings, 1997-2004 (cont.)

California OES Code	Occupation	Number of Job Openings 1997-2004	Education/Experience (BLS Training Level)
49008	SALES REPRESENTATIVES, NON-SCIENTIFIC, EX RETAIL	630	MODERATE-TERM ON-THE-JOB TRAINING (10)
49017	COUNTER AND RENTAL CLERKS	620	SHORT-TERM ON-THE-JOB TRAINING (11)
22127	COMPUTER ENGINEERS	610	BACHELOR'S DEGREE (5)
13017	ENGINEERING, MATHEMATICAL, AND NATURAL SCIENCE MGRS	580	WORK EXP, PLUS A BACHELOR'S OR HIGHER (4)
53102	TELLERS	560	SHORT-TERM ON-THE-JOB TRAINING (11)
49021	STOCK CLERKS--SALES FLOOR	550	SHORT-TERM ON-THE-JOB TRAINING (11)
68038	CHILD CARE WORKERS	530	SHORT-TERM ON-THE-JOB TRAINING (11)
63014	POLICE PATROL OFFICERS	520	LONG-TERM ON-THE-JOB TRAINING (9)
53905	TEACHER AIDES & EDUCATIONAL ASSISTANTS, CLERICAL	510	SHORT-TERM ON-THE-JOB TRAINING (11)
95014	PETROLEUM REFINERY, CONTROL PANEL OPERATORS	500	LONG-TERM ON-THE-JOB TRAINING (9)
65032	COOKS--SPECIALTY FAST FOOD	490	SHORT-TERM ON-THE-JOB TRAINING (11)
97102	TRUCK DRIVERS, HEAVY	490	SHORT-TERM ON-THE-JOB TRAINING (11)
58023	STOCK CLERKS--STOCKROOM, WAREHOUSE	480	SHORT-TERM ON-THE-JOB TRAINING (11)
66005	MEDICAL ASSISTANTS	480	MODERATE-TERM ON-THE-JOB TRAINING (10)
87202	ELECTRICIANS	470	LONG-TERM ON-THE-JOB TRAINING (9)
31304	TEACHERS, KINDERGARTEN	460	BACHELOR'S DEGREE (5)
15005	EDUCATION ADMINISTRATORS	450	WORK EXP, PLUS A BACHELOR'S OR HIGHER (4)
67002	MAIDS AND HOUSEKEEPING CLEANERS	450	SHORT-TERM ON-THE-JOB TRAINING (11)
58028	TRAFFIC, SHIPPING, RECEIVING CLERKS	440	SHORT-TERM ON-THE-JOB TRAINING (11)
87402	PAINTERS, PAPERHANGERS--CONSTRUCTION	440	MODERATE-TERM ON-THE-JOB TRAINING (10)
	TOTAL OF THESE OCCUPATIONS	56,820	

(1) Excludes not elsewhere classified (NEC) categories and occupations with employment of less than 200 in 2004.

Source: Office of District Research, Contra Costa CCD. March 2002. Based on California Employment Development Department, Labor Market Information 1997-2004.

Table 25. Contra Costa County - Occupations With the Most Declines, 1997-2004

California OES Code	Occupation	Annual Averages 1997(2)	2004	Number of Job Declines	Openings Due to Separations	Education/ Experience (BLS Training Level)
53102	TELLERS	2,620	2,390	-230	790	SHORT-TERM ON-THE-JOB TRAINING (11)
57108	CENTRAL OFFICE OPERATORS	470	380	-90	70	MODERATE-TERM ON-THE-JOB TRAINING (10)
55307	TYPISTS, INCLUDING WORD PROCESSORS	1,010	950	-60	140	MODERATE-TERM ON-THE-JOB TRAINING (10)
56011	COMPUTER OPS--EX PERIPHERAL EQUIPMENT	380	340	-40	30	MODERATE-TERM ON-THE-JOB TRAINING (10)
53108	TRANSIT CLERKS	100	70	-30	20	SHORT-TERM ON-THE-JOB TRAINING (11)
98705	REFUSE COLLECTORS	420	400	-20	130	SHORT-TERM ON-THE-JOB TRAINING (11)
95008	CHEMICAL PLANT, SYSTEM OPERATORS	390	370	-20	90	LONG-TERM ON-THE-JOB TRAINING (9)
25302	OPERATIONS & SYSTEMS RESEARCHERS--EX COMPUTER	330	310	-20	70	MASTER'S DEGREE (3)
24505	CHEMICAL TECHS--EXCEPT HEALTH	270	250	-20	40	ASSOCIATE DEGREE (6)
53911	PROOFREADERS AND COPY MARKERS	110	90	-20	20	SHORT-TERM ON-THE-JOB TRAINING (11)
65023	BUTCHERS AND MEAT CUTTERS	370	360	-10	60	LONG-TERM ON-THE-JOB TRAINING (9)
97953	PUMP OPERATORS	310	300	-10	50	MODERATE-TERM ON-THE-JOB TRAINING (10)
92908	PHOTOGRAPHIC PROCESSING MACHINE OPERATORS/TENDERS	130	120	-10	40	SHORT-TERM ON-THE-JOB TRAINING (11)
24511	PETROLEUM TECHNICIANS	130	120	-10	20	ASSOCIATE DEGREE (6)
53502	WELFARE ELIGIBILITY WORKERS, INTERVIEWERS	170	160	-10	20	MODERATE-TERM ON-THE-JOB TRAINING (10)
85505	FRAME WIRERS, CENTRAL OFFICE	110	100	-10	20	POST-SECONDARY VOCATIONAL EDUCATION (7)
89135	BOILERMAKERS	110	100	-10	20	LONG-TERM ON-THE-JOB TRAINING (9)
93935	CANNERY WORKERS	90	80	-10	20	SHORT-TERM ON-THE-JOB TRAINING (11)
55326	PROCUREMENT CLERKS	120	110	-10	10	SHORT-TERM ON-THE-JOB TRAINING (11)
57105	DIRECTORY ASSISTANCE OPERATORS	60	50	-10	10	MODERATE-TERM ON-THE-JOB TRAINING (10)
92962	SEPARATING, STILL MACHINE OPERATORS, TENDERS	90	80	-10	10	MODERATE-TERM ON-THE-JOB TRAINING (10)
28311	TITLE EXAMINERS AND ABSTRACTORS	70	60	-10	0	MODERATE-TERM ON-THE-JOB TRAINING (10)
	TOTAL OF THESE OCCUPATIONS	7,860	7,190	-670	1,680	

(1) Excludes not elsewhere classified (NEC) categories and occupations with employment of less than 200 in 2004.
(2) March 1998 Benchmark

Source: Office of District Research, Contra Costa CCD. March 2002. Based on California Employment Development Department, Labor Market Information 1997-2004.

Table 26. Occupational Areas in the County Showing Growth and Demand for Trained Employees

Occupational Area/ (OES Code)	Required Education	# New Jobs/ Openings 95-02/97-04*	Projected Growth	Countywide Growth 95-02/97-04*	Difficulty of Filling Positions**	Schools Offering Related Training*
Accountants Auditors (211140)	HS+	1,300	30.6%	21.4%	IA - MVD EA - NLD	DVC, 3 others
Adjustment Clerks (531230)	HS+	350*	18.9%	18.0%*	IA – MVD EA - MVD	Std***
Automotive Mechanics (853020)	<HS	1,180	38.0%	21.4%	IA – MVD EA - MVD	CCC, 1 other
Biotechnology Research Assistants (041061999)	HS+	Not Available	—	21.4%	IA – MVD EA - MVD	CCC, DVC
Bookkeeping, Accounting and Auditing Clerks (553380)	HS+	880*	6.2%	18.0%*	IA – MVD EA - MVD	Std***
Bus & Truck Mechanics & Diesel Engine Specialists (853110)	<HS	110	13.2%	21.4%	IA - MVD EA - MVD	CCC, DVC, LMC, 3 others
Child Care Workers (680380)	HS+	190	20.0%	21.4%	IA – MVD EA - MVD	CCC, DVC, 2 others
Computer Network Technicians (033162996)	HS+	Not Available*	—	18.0%*	IA – NLD EA - MVD	Std***
Computer Programmers, Including Aides (251051)	HS+	1,670	51.2%	21.4%	IA – MVD EA - MVD	CCC, DVC, 2 others
Computer Support Specialists (251040)	HS+	20	7.1%	21.4%	IA – MVD EA - MVD	Std***
Construction Managers (150170)	HS+	442	32.2%	21.4%	IA – MVD EA - MVD	DVC, LMC, 4 others
Cooks – Restaurant (650260)	<HS	770*	17.2%	18.0%*	IA – MVD EA - MVD	Std***
Data Processing Equipment Repairers (857050)	HS+	30*	22.2%	18.0%*	IA – NLD EA - MVD	Std***
Dental Assistants (660020)	HS+	350*	20.7%	18.0%*	IA – MVD EA - MVD	Std***
Drafters (225140)	HS+	430	18.1%	21.4%	IA – MVD EA - MVD	CCC, 2 others
Electric Home Appliance & Power Tool Repairers (857110)	HS+	30	28.6%	21.4%	IA - MVD EA - MVD	DVC, LMC
Electrical & Electronic Assemblers (939050)	HS+	30*	6.7%	18.0%*	IA – MVD EA - MVD	Std***
Electrical & Electronic Engineering Technicians & Technologists (225050)	HS+	320	24.1%	21.4%	IA – MVD EA - MVD	Std***
Electronic Home Entertainment Equipment Repairers (857080)	HS+	10*	Stable	18.0%*	IA – MVD EA - MVD	Std***
Employment Interviewers Private or Public (215080)	HS+	90*	17.4%	18.0%*	IA – MVD EA - MVD	Std***

continued

Occupational Areas in the County Showing Growth and Demand for Trained Employees (cont.)

Occupational Area/ (OES Code)	Required Education	# New Jobs/ Openings 95-02/97-04*	Projected Growth	Countywide Growth 95-02/97-04*	Difficulty of Filling Positions**	Schools Offering Related Training***
Food Preparation Workers (650380)	<HS	840	22.6%	21.4%	IA – MVD EA - MVD	CCC, DVC, LMC, 6 others
General Managers & Top Executives (190050)	HS+	2,470*	17.9%	18.0%*	IA – MVD EA - MVD	
General Office Clerks (553470)	<HS	3,260	15.7%	21.4%	IA – NLD EA - MVD	CCC, DVC, 7 others
Hairdressers, Hairstylists, & Cosmetologists (680050)	<HS	240	12.5%	21.4%	IA – MVD EA - MVD	DVC, LMC, 6 others
Heating, Air Conditioning, & Refrigeration Mechanics & Installers (859020)	HS+	210	38.9%	21.4%	IA – MVD EA - MVD	DVC, 2 others
Human Service Workers (273080)	HS+	230	38.5%	21.4%	IA – MVD EA - MVD	DVC, LMC, 3 others
Instructional Aides (315211)	HS+	600	11.1%	21.4%	IA – MVD EA - MVD	CCC, DVC, LMC, 3 others
Instructors & Coaches Sports & Physical (313210)	HS+	350*	34.1%	18.0%*	IA - MVD EA - MVD	Std***
Internet Web Site Designers/Developers (Webmasters) (031064999)	HS+	Not Available	Stable	21.4%	IA - MVD EA - MVD	Std***
Maids & Housekeeping Cleaners (670020)	<HS	850	24.7%	21.4%	IA – NLD EA - MVD	DVC, 3 others
Manager, Retail Store (185167999)	HS+	Insufficient Data*	—	18.0%*	IA – MVD EA - MVD	Std***
Marketing, Advertising & Public Relations Managers (130110)	HS+	400*	16.7%	18.0%*	IA – MVD EA - MVD	Std***
Personnel, Training, & Labor Relations Managers (130050)	HS+	380	26.2%	21.4%	IA - MVD EA - NLD	8 others
Physical Therapy Assistants (660171)	HS+	Insufficient Data*	—	18.0%*	IA – MVD EA - NLD	
Receptionists & Information Clerks (553050)	HS+	1,670	31.9%	21.4%	IA – MVD EA - NLD	CCC, DVC, LMC, 7 others
Secretaries, Except Legal & Medical (551080)	HS+	2,390	24.7%	21.4%	IA – MVD EA - NLD	CCC, DVC, LMC, 8 others
Software Engineers (030062999)	HS+	Insufficient Data*	—	18.0%*	IA – MVD EA - MVD	Std***
Teachers & Instructors Vocational Education (313140)	HS+	220	22.4%	21.4%	IA - NLD EA - MVD	Std***
Traffic, Shipping & Receiving Clerks (580280)	HS+	830	14.8%	21.4%	IA – NLD EA - NLD	1 other

* Number with asterisk regard 1997-2004 forecasted openings.

** IA = Inexperienced applicants.
EA=Experienced applicants.
NLD = No or little difficulty.
MVD = Moderate to very difficult.

*** Std = Multiple institutions within county include one or more of CCCCD colleges.

Source: Office of District Research, Contra Costa CCD. March 2002. Based on Occupational Outlook & Vocational Training Directory or Contra Costa County, 2000-2001.

Vision of Business Community and Implications for Partnerships with CCCCD*

In May 2000, the Contra Costa Economic Partnership (CCEP) and the Contra Costa Council (CCC) joined forces with other county business organizations to hold an Education Forum. The topic of this Forum was "Creating an Educated Workforce for our Knowledge-Based Economy". This summit brought together business and education leaders to discuss effective strategies for teamwork with the focus on preparing students for high-wage, high-skilled, 21st-Century jobs. The outcomes of this conference were the guiding force for the development of key education initiatives that are encompassed in the following Executive Summary of this Forum.

It is the intent of the two organizations (CCEP and CCC) to play an intermediary role between business and education for the development and support of collaborative strategies which include a shared vision, strong leadership, data-driven decision-making, and professional development components. The recommended actions below will be the education focus of the CCEP and the CCC from 2000 through 2003.

Recommended Actions

Goal 1: Support the integration of technology into the education system to achieve high academic standards using real world application models.

Objectives:

- Develop and support collaborative strategies to provide students and teachers with learning opportunities involving current and emerging technologies in specific fields, including software, biotech, and telecommunications.
- Facilitate industry input into the creation of curriculum and classes.
- Facilitate the provision of industry resources (e.g., equipment, software, human and financial resources) to implement curriculum and enhance classes.

Goal 2: Expose educators to other fields of work through job shadowing, internships, career days, and other workplace-based experiences.

Objectives:

- Facilitate the provision of opportunities for educators to experience effective workplace learning activities. Increase the number of employers providing such opportunities. Increase the number of educators participating in such opportunities.

Goal 3: Support learning strategies (e.g., career academies, smaller learning communities, work-based learning) that provide a more personalized school experience and integrate academic studies with real world applications.

(continued)

* Adapted from Contra Costa Economic Partnership and the Contra Costa Council report, **Creating an Educated Workforce for Our Knowledge-Based Economy**, August 2000.

Objectives:

- Advocate at the local, regional, state and national level in support of educational initiatives that provide support for systemic progress, professional development and effective business/education collaborations.
- Endorse and support the development and implementation of grant proposals for specific relevant projects and programs.
- Support relevant legislation at the state and national levels.
- Facilitate the provision of opportunities for students to experience effective workplace learning activities. Increase the number of employers providing such opportunities. Increase the number of students participating in such opportunities.
- Facilitate business participation in career academies.
- Convene business/education forums for industry specific academies.

Goal 4. Recognize programs, organizations and individuals that exemplify the Guiding Principles. Objectives: Establish an annual awards program for this purpose.

Objectives:

- Establish criteria consistent with the Guiding Principles.
- Facilitate the nomination and selection of awardees.

Vocational Education Programs, Assessment, and Vision at CCCCD

Over the last several years, CCCCD has moved to develop institutional effectiveness indicators to gauge its progress along key educational dimensions. Part of CCCCD's Institutional Effectiveness 2000 Report regard the performance of students receiving Voc. Ed. instruction and the progress of CCCCD in meeting its Partnership for Excellence (PFE) goals in this area. These evaluations build on data and analyses from the State Chancellor's Office that permit comparisons across select community college district. Figure 10 and Tables 28-33 summarize these relevant findings for each indicator or PFE goal to the extent possible. These and several other sources of program assessment data are included in this section: SB 645 Follow-Up Assessment of Voc. Ed. Participants, VTEA 2001-02 Core Indicators of Performance of Voc. Ed. Participants, and CC Benefits Inc. Study Highlights

Demographics of Vocational Education Students and Course Profile

As can be seen in Table 27, this spring semester 25,153 students enrolled in 914 sections offering Voc. Ed. instruction: 84% in Introductory courses, 13% in Advanced-Level courses, and 3% in Apprenticeship courses. The reasons for why there is a substantial drop in enrollment between each level of instruction are not clear, and an inquiry is needed to identify the factors that may contribute to this.

It is known that Apprenticeship courses are limited to students who are employed by businesses that have agreements with the District. Briefly, the District provides job relevant training and the companies involved provide state-of-the-art technology to make this possible. There are a limited number of these arrangements, and this would explain in part why there are a relatively small number of students enrolled in these courses. Introductory courses, on the other hand, provide entry-level skills and are often prerequisites to Advanced-Level coursework. It is curious, therefore, why there aren't more students enrolled in Advanced-Level coursework given the relatively large number of students taking Introductory courses.

A relatively greater percent of males are enrolled in Apprenticeship courses than are enrolled in Introductory and Advanced-Level courses. In part, this predominance of males may reflect the fact that Apprenticeship and some Advanced-Level courses, more so than are Introductory courses, are closely tied to occupational areas traditionally employing more males than females such as carpentry and plumbing.

The race/ethnicity of students for Introductory and Advanced-Level courses mirrors that of students in general. For apprenticeship courses there are substantially less Asians and Blacks and more whites. Again, this may reflect in part the practices of the occupations involved in hiring employees from different ethnic backgrounds. The proportion of minority students participating in Voc. Ed. is equal to or greater than their representation in the county population.

Institutional Effectiveness Indicators

Figure 10 and Tables 28-33 summarize assessment of successful course completion and retention rates for Voc. Ed. courses in general and for different levels of Voc. Ed. instruction. Where possible, these are compared with like rates for comparable districts and systemwide performance.

This section will cover the three main types of Voc. Ed. courses that are available at CCCCD. The State MIS and CCCCD use the following designations to indicate the extent to which each type of course is "occupational" and to help identify course sequence in occupational programs:

Apprenticeship (Code A): These courses are designed for indentured apprentices only and must have the approval of the State of California, Department of Industrial Relations, Division of Apprenticeship Standards. Some examples of apprenticeship courses are: Carpentry, Plumbing and Machine Tool.

Advanced (Code B): These courses are those taken by students in the advanced stages of their occupational programs. A "B" course is offered in one specific occupational area only and clearly labels its taker as a major in this area. Priority letter "B" should be assigned sparingly, in most cases no more than two courses in any one program should be labeled "B". Each "B" level course must have a "C" level prerequisite in the same program area. Some examples of "S" level courses are: Dental Pathology, Advanced Video Tape, Advanced Applied Acting, Legal Secretarial Procedures, Contact Lens Laboratory, Advanced Radiology Technology, Fire Hydraulics, Livestock and Dairy Selections, Real Estate Finance, Cost Accounting.

Introductory (Code C): These courses are clearly occupational but not advanced. Courses will generally be taken by students in the middle stages of their programs and should be of difficulty level sufficient to detract "drop-ins". A "C" level course may be offered in several occupational programs within a broad area such as business or agriculture. The "C" priority, however, should also be used for courses within a specific program area when the criteria for "B" classification are not met. A "C" level course should provide the student with entry-level job skills. Some examples of "C" level courses are: Soils, Credit and Collections, Principles of Advertising, Air Transportation, Clinical Techniques, Principles of Patient Care, Food and Nutrition, Sanitation/Safety, Shorthand, Small Business Management, Advanced Typing, Technical Engineering.

Table 27. Demographics of Students Enrolled in Vocational Education Courses Spring 2002*

(Unduplicated Headcount, First-Census)**

Voc. Ed. Level of Course/Site	Number of Students for Spring 2002	Average Age of Students	Gender		Ethnicity					
			Female	Male	Amer. Indian	Asian/Pac. Is./Filipino	Black	Hispanic	White	Other Non-White
Apprenticeship (#Sections = 45)										
CCC	46	31	4%	96%	0%	24%	14%	24%	33%	5%
DVC	620	29	3%	97%	2%	5%	7%	16%	68%	1%
LMC	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CCCCD	**666**	**29**	**3%**	**97%**	**2%**	**6%**	**7%**	**17%**	**66%**	**2%**
Advanced-Level (#Sections = 156)										
CCC	603	31	66%	34%	0%	29%	25%	21%	23%	2%
DVC	1,640	33	46%	54%	1%	21%	3%	11%	61%	3%
LMC	1,083	34	43%	57%	1%	18%	8%	16%	56%	2%
CCCCD	**3,326**	**33**	**48%**	**52%**	**1%**	**21%**	**9%**	**14%**	**52%**	**3%**
Introductory (#Sections = 713)										
CCC	3,295	31	65%	35%	1%	23%	27%	23%	24%	2%
DVC	11,990	33	54%	46%	1%	23%	5%	11%	58%	4%
LMC	5,876	31	58%	42%	1%	18%	8%	16%	56%	2%
CCCCD	**21,161**	**32**	**57%**	**43%**	**1%**	**20%**	**11%**	**16%**	**49%**	**3%**
Total Student Population										
CCC	7,261	31	63%	37%	1%	23%	27%	26%	22%	2%
DVC	20,444	29	55%	45%	1%	19%	5%	12%	60%	3%
LMC	8,389	31	59%	41%	1%	12%	13%	22%	50%	2%
More than one college	803	29	55%	45%	1%	22%	12%	16%	45%	4%
CCCCD	**36,897**	**30**	**58%**	**42%**	**1%**	**18%**	**11%**	**17%**	**50%**	**3%**
	County Population:		**51%**	**49%**	**0.4%**	**10.8%**	**9.2%**	**17.7%**	**57.9%**	**0.4%**

* Each demographic statistic is based on records containing related data. Sample size may vary for each attribute assessed.

** For a given type of Voc. Ed. course and within a given college, student headcounts are unduplicated. However, across courses and colleges, student totals may reflect duplicated headcounts.

Source: Office of District Research, Contra Costa CCD. Enrollment information based on data provided by IT department, 3/11/02. County statistics based on U.S. Census Bureau, Census 2000 of Population and Housing, Summary File.

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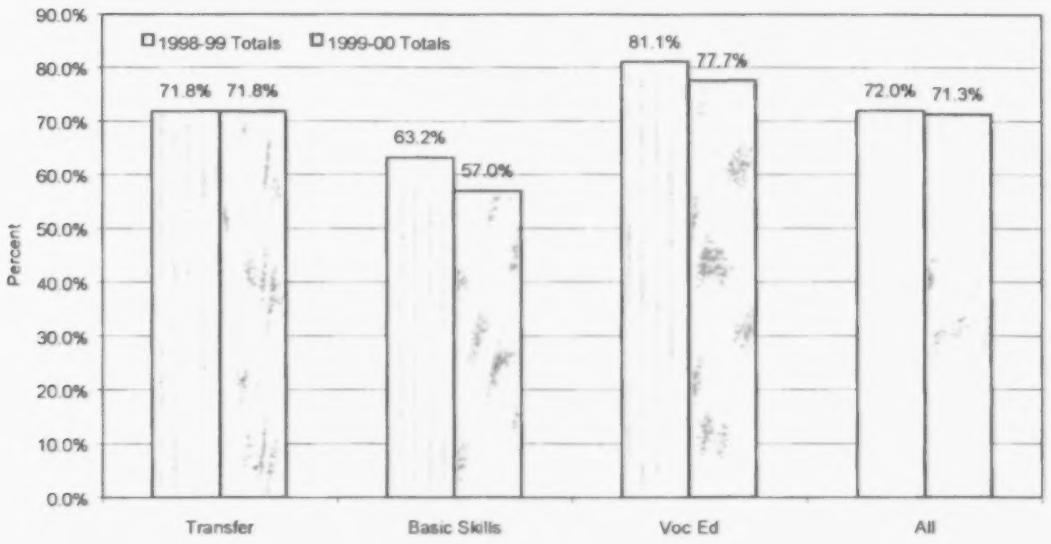
Figure 10. Successful Course Completion, 1998-99 and 1999-00



Comments/Analysis:

Figure 10 shows the successful course completion rates (i.e., a grade of "C" or better) of Vocational Education (Voc. Ed.) courses are relatively higher than for Transfer and Basic Skills courses. This finding is to be expected. Presumably, the success rate of Voc. Ed. courses is substantially higher than that for Basic Skills because students in the latter are not as academically prepared. The fact that they are slightly higher than that for transfer courses could be due to a number of variables, such as maturity of students enrolled, experience level of students, e.g. a number of students in Voc. Ed. are upgrading skills and therefore have job experience to reinforce learning.

Source: Office of District Research, Contra Costa CCD. March 2002. Based on System Performance on Partnership for Excellence Goals, April 2001. (CCC Chancellor's Office)

Table 28. Successful Course Completion Rates for Vocational Education Courses[1]

	1996-97	1997-98	1998-99	1999-00	2000-01	96/97-00/01
Site	% Successful	% Successful	% Successful	% Successful	% Successful	**Average**
CCC	82.8	81.4	82.0	74.7	75.4	**79.3**
DVC	84.9	83.9	81.9	76.3	73.6	**80.1**
LMC	75.6	78.7	80.0	80.0	78.0	**78.5**
CCCCD	80.3	81.0	81.1	77.7	76.2	**79.3**

Comments/Analysis:

Over the last five years, the successful course completion rates for Voc. Ed. have varied within and across colleges. These rates have shown a negative trend for CCC and DVC, whereas they have been positive for LMC. The reasons for this are being examined as they reflect the cumulative effects of a myriad of factors. The five-year average for CCCCD, however, is close to the 80% the State expects for the 2005-06 Partnership for Excellence goal.

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[1] Based on **System Performance on Partnership for Excellence Goals, District and College Baseline Data**, Chancellor's Office, California Community Colleges, April 2001.

Table 29. Successful Completion Rates for All Vocational Education Courses, CCCCD Compared with Average Such Rates of Bay 10, Multi-College* Districts, and System[1]

	1996-97	1997-98	1998-99	1999-00	2000-01	96/97-00/01
	% Successful	% Successful	% Successful	% Successful	% Successful	Average
CCCCD	80.3	81.0	81.1	77.7	76.2	**79.3**
Bay 10	73.4	75.2	78.7	77.6	74.6	**75.9**
Multi-College	75.1	75.5	76.5	77.3	77.7	**76.4**
Systemwide	76.1	77.2	77.2	78.7	79.4	**77.7**

Comments/Analysis:

CCCCD's successful course completion rates for Voc. Ed. compare favorably with the average rates of other institutional benchmarks: the Bay Area's ten community college districts, multi-college community college districts in the state, and the California Community College System. If CCCCD is comparable to these institutions and is performing similarly in relevant areas, then CCCCD should yield comparable results. The findings reported here are consistent with this position. The five-year average for CCCCD is substantially higher than is the case for the comparison groups. It is worth noting, however, that CCCCD's performance has declined by 6.0% over the last two years, whereas the performance levels for other multi-college districts and systemwide have increased 1.6% and 2.8% respectively. These changes reflect the cumulative effects of a myriad of factors, so further study would be needed to determine specific cause and potential interventions. As mentioned, the average of 79.3% is just under the 80% which needs to be achieved by CCCCD to meet its 2005-06 PFE goal.

* Los Angeles, which has nine colleges, has been excluded from the Multi-College analysis. Its funding and performance patterns tend to be atypical and its inclusion would invalidate comparative analysis.

[1] Based on **System Performance on Partnership for Excellence Goals, District and College Baseline Data,** Chancellor's Office, California Community Colleges, April 2001. See Appendix C for specification of Bay 10 and Multi-College districts.

Table 30. Course Retention Rates for Three Vocational Education Levels

Type Course	1996-97	1997-98	1998-99	1999-00	2000-01	96/97-00/01
Apprenticeship	% Successful	% Successful	% Successful	% Successful	% Successful	**Average**
CCC	87.1	97.6	96.2	93.8	97.7	**94.5**
DVC	92.0	93.4	96.9	93.4	96.0	**94.3**
LMC	n/a	n/a	n/a	n/a	n/a	**n/a**
CCCCD	91.8	93.7	96.8	93.5	96.2	**94.4**
Advanced						
CCC	88.3	85.7	87.8	88.1	88.9	**87.8**
DVC	88.4	86.6	87.5	85.6	80.7	**85.8**
LMC	93.8	96.6	n/a	96.4	97.0	**96.0**
CCCCD	90.8	91.8	91.6	92.1	90.2	**91.3**
Introductory						
CCC	85.2	85.3	88.6	87.6	90.4	**87.4**
DVC	86.7	85.9	87.5	82.6	79.8	**84.5**
LMC	82.3	83.3	n/a	83.5	85.8	**83.7**
CCCCD	85.0	85.0	87.2	83.9	83.6	**84.9**

Comments/Analysis:

On average, course retention rates over the last five years for CCCCD show relatively higher performance levels over 1996-97 for all three Voc. Ed. instructional levels.

Table 31. Course Retention Rates for Three Vocational Education Levels Comparative Rates for CCCCD, Bay 10, Multi-College* Districts, and System[1]

Type Course	1996-97	1997-98	1998-99	1999-00	2000-01	96/97-00/01
Apprenticeship	% Retention	% Retention	% Retention	% Retention	% Retention	**Average**
CCCCD	91.8	93.7	96.8	93.5	96.2	**94.4**
Bay 10	94.9	95.1	95.3	94.4	95.6	**95.1**
Multi-College	95.0	94.1	94.5	94.3	95.9	**94.8**
Systemwide	95.4	95.5	95.5	95.5	95.6	**95.5**
Advanced						
CCCCD	90.8	91.8	91.6	92.1	90.2	**91.3**
Bay 10	88.9	89.3	88.3	88.8	87.3	**88.5**
Multi-College	88.5	88.5	87.5	87.3	87.2	**87.8**
Systemwide	88.5	88.5	88.5	88.2	88.2	**88.4**
Introductory						
CCCCD	85.0	85.0	87.2	83.9	83.6	**84.9**
Bay 10	85.4	85.3	84.1	83.4	83.2	**84.3**
Multi-College	84.7	84.4	84.3	84.2	84.4	**84.4**
Systemwide	85.2	85.4	85.4	84.7	85.5	**85.2**

Comments/Analysis:

CCCCD's average course retention rates for each of its three Voc. Ed. coursework levels compare favorably with the average such rates of other institutional benchmarks. If CCCCD is comparable and performing similarly to these other institutions in relevant areas, it should yield comparable results other things being equal. The findings reported here are consistent with this position.

* Los Angeles which has nine colleges has been excluded from the Multi-College analysis. Its funding and performance patterns tend to be atypical and its inclusion would invalidate comparative analysis.

[1] Based on **System Performance on Partnership for Excellence Goals, District and College Baseline Data**, Chancellor's Office, California Community Colleges, April 2001. See Appendix C for specification of Bay 10 and Multi-College districts.

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Table 32. Successful Course Completion Rates for Three Vocational Education Levels[1]

Type Course	1996-97	1997-98	1998-99	1999-00	2000-01	96/97-00/01
Apprenticeship	% Successful	% Successful	% Successful	% Successful	% Successful	**Average**
CCC	71.0	82.4	75.9	78.8	83.0	**72.8**
DVC	91.3	91.7	95.5	91.7	94.0	**92.8**
LMC	n/a	n/a	n/a	n/a	n/a	**n/a**
CCCCD	90.3	91.0	94.1	93.5	93.0	**92.4**
Advanced						
CCC	75.4	72.8	73.4	71.3	75.0	**73.6**
DVC	80.2	79.9	79.3	78.5	73.9	**78.4**
LMC	90.8	92.4	n/a	93.9	94.7	**93.0**
CCCCD	84.1	85.5	84.7	92.1	84.9	**86.3**
Introductory						
CCC	73.1	73.0	74.2	72.3	72.9	**73.1**
DVC	77.2	76.5	77.2	72.3	70.0	**74.6**
LMC	68.2	69.0	n/a	68.3	69.8	**68.8**
CCCCD	73.6	73.6	74.8	83.9	70.4	**75.3**

Comments/Analysis:

On average, the successful course completion rates over the last five years for CCCCD show relatively higher performance levels over 1996-97 for all three Voc. Ed. instructional levels. This is impressive given the high course retention rates summarized in Table 30.

[1] Based on **System Performance on Partnership for Excellence Goals, District and College Baseline Data**, Chancellor's Office, California Community Colleges, April 2001.

Table 33. Successful Course Completion Rates for Three Vocational Education Levels Comparative Rates for CCCCD, Bay 10, Multi-College* Districts, and System[1]

Type Course	1996-97	1997-98	1998-99	1999-00	2000-01	96/97-00/01
Apprenticeship	% Successful	% Successful	% Successful	% Successful	% Successful	**Average**
CCCCD	90.3	91.0	94.1	93.5	93.0	**92.4**
Bay 10	88.3	86.9	88.0	94.4	89.4	**89.4**
Multi-College	86.7	86.9	87.8	94.3	89.2	**89.0**
Systemwide	72.1	71.3	71.3	95.5	86.7	**79.4**
Advanced						
CCCCD	84.1	85.5	84.7	92.1	84.9	**86.3**
Bay 10	80.5	81.5	80.4	88.8	78.0	**81.8**
Multi-College	79.6	79.5	78.0	87.3	76.5	**80.2**
Systemwide	79.7	79.5	79.5	88.2	78.3	**81.0**
Introductory						
CCCCD	73.6	73.6	74.8	83.9	70.4	**75.3**
Bay 10	72.4	72.1	72.0	83.4	70.7	**74.1**
Multi-College	72.0	72.0	72.1	84.2	71.6	**74.4**
Systemwide	72.5	73.1	73.1	84.7	73.0	**75.3**

Comments/Analysis:

The average course success rates over the last five years for the above three Voc. Ed. instructional levels compare favorably with the average such rates of other institutional benchmarks: the Bay Area's ten community college districts, multi-college community college districts in the state, and the California Community College System. Other things being equal, if CCCCD is comparable to these institutions and is performing similarly in relevant areas, then CCCCD should yield comparable results. The findings reported here are consistent with this position. Indeed, these findings show that CCCCD's performance in this area was relatively higher than those of other institutions in all three Voc. Ed. levels, with the Advanced Level showing the greatest performance difference.

* Los Angeles which has nine colleges has been excluded from the Multi-College analysis. Its funding and performance patterns tend to be atypical and its inclusion would invalidate comparative analysis.

[1] Based on **System Performance on Partnership for Excellence Goals, District and College Baseline Data**, Chancellor's Office, California Community Colleges, April 2001. See Appendix C for specification of Bay 10 and Multi-College districts.

Partnership for Excellence Goals

As is known, Goals Three and Four of the PFE initiative regards workforce development. Specifically, it stipulates an increase in the percent and number of successfully completed Voc. Ed. courses that are to be achieved by 2005-06. Tables 34 and 35 list these goals for Voc. Ed. courses in general and for different levels of Voc. Ed. instructional. Tables 36-38 summarize related assessment results.

Table 34. PFE Goal Three: Increase in the Overall Rate of Course Completion

Systemwide Goals

	Course Completion Rate by Course Type		
	1995-96 Baseline	Expected by 2005	% Change*
Transferable	68.3%	70.8%	3.7%
Vocational	77.2%	80.0%	3.6%
Basic Skills	60.3%	62.5%	3.6%
Overall	**68.1%**	**70.6%**	**3.7%**

Implications for District

	1995-96 Baseline			Expected by 2005*		
	CCC	**DVC**	**LMC**	**CCC**	**DVC**	**LMC**
Transferable	67.5%	71.1%	69.6%	71.2%	74.8%	73.3%
Vocational	82.1%	83.7%	76.9%	85.7%	87.3%	80.5%
Basic Skills	55.1%	64.8%	61.0%	58.7%	68.4%	64.6%
Overall	**67.0%**	**72.0%**	**71.0%**	**70.7%**	**75.7%**	**74.7%**

* Expected percentage change applies to both the state and district colleges. For example, the 3.7% percentage increase expected for transferable courses at the state level also applies to the district and each of its colleges. The exact percentage which holds will vary due to rounding error.

Source: Office of District Research, Contra Costa CCD, December 10, 2001. UC and CSU figures based on information from System Performance on Partnership for Excellence, District and College Baseline Data for 1997-1998, 1998-99, 1999-00. Chancellor's Office, California Community Colleges, April 2001.

Table 35. PFE Goal Four: Increase in the Number of Successfully Completed Vocational Education Courses

Systemwide Goals

	Type and Number of Successfully Completed Courses		
	1997-98 Baseline	Expected by 2005	% Change*
Apprenticeship	18,125	24,599	35.7%
Advanced-Level	277,556	376,688	35.7%
Introductory	783,060	1,062,378	35.7%
Total	**1,078,741**	**1,463,665**	**35.7%**

Implications for District

	1997-98 Baseline			Expected by 2005*		
	CCC	**DVC**	**LMC**	**CCC**	**DVC**	**LMC**
Apprenticeship	70	967	0	95	1,312	0
Advanced-Level	909	1,906	3,876	1,234	2,586	5,260
Introductory	4,700	14,409	7,794	6,378	19,553	10,576

* Expected percentage change applies to both the state and district colleges. For example, the 35.7% percentage increase expected in the number of successfully completed apprenticeship courses at the state level also applies to the district and each of its colleges.

Source: Office of District Research, Contra Costa CCD, December 10, 2001. UC and CSU figures based on information from System Performance on Partnership for Excellence, District and College Baseline Data for 1997-1998, 1998-99, 1999-00. Chancellor's Office, California Community Colleges, April 2001.

Table 36. Changes in the Overall Rate of Successful Course Completion Over 1995-96 Performance Levels for Vocational Education Courses in Relation to Targeted PFE Numerical Goals for 2005-06

	1995-96 Baseline	1999-00 Performance	2000-01 Performance	95/96-00/01	2005-06 Target
	% Successful	% Successful	% Successful	% Change	%
CCC	82.1	74.7	75.4	**-8.9**	85.7
DVC	83.7	76.3	73.6	**-13.7**	87.3
LMC	76.9	80.0	78.0	**1.4**	80.5

Table 37. Successful Vocational Education Course Completion Rates for CCCCD Compared with Average Such Rates of Bay 10, Multi-College* Districts, and System

	Baseline 1995-96	1998-99	1999-00	2000-01	95/96-00/01
	% Successful	% Successful	% Successful	% Successful	% Change
CCCCD	80.2	81.1	77.7	76.2	**-5.2**
Bay 10	78.7	78.7	77.6	74.6	**-5.5**
Multi-College	77.6	76.5	77.3	77.7	**0.1**
Systemwide	77.2	77.2	78.7	79.4	**2.8**

Comment/Analysis:

District colleges have a relatively lower rate of successful course completion than what was the case in 1995-96. Their performance in this area is comparable to that of Bay 10 districts. Other multi-college districts elsewhere and the system as a whole performed better on this measure than did CCCCD. Further study is needed to identify reasons and potential intervention.

Source: Office of District Research, Contra Costa CCD. Based on System Performance on Partnership for Excellence Goals, Chancellor's Office, California Community Colleges, April 2001.

* Los Angeles which has nine colleges has been excluded from the Multi-College analysis. Its funding and performance patterns tend to be atypical and its inclusion would invalidate comparative analysis.

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Table 38. Changes in the Number of Successfully Completed Introductory, Advanced, and Apprenticeship Level Vocational Education Courses (# Success) Over 1997-98 Totals [1] in Relation to Targeted PFE Numerical Goals for 2005-06

Type Course/Campus	Baseline 1997-98 Success	1999-00 Performance	2000-01 Performance	% Change	2005-06 Target [2]
Apprenticeship	#	#	#	%	#
CCC	70	63	73	**4.3**	95
DVC	967	922	872	**-9.8**	1,312
LMC	n/a	n/a	n/a	n/a	n/a
CCCCD	**1,038**	**985**	**945**	**-9.0**	**1,407**
Advanced					
CCC	909	748	644	**-29.2**	1,234
DVC	1,906	1,922	1847	**-3.1**	2,586
LMC	3,876	4,425	3511	**-9.4**	5,260
CCCCD	**6,691**	**7,095**	**6,002**	**-10.3**	**9,080**
Introductory					
CCC	4,700	4,754	4010	**-14.7**	6,378
DVC	14,409	11,776	11913	**-17.3**	19,553
LMC	7,794	7,045	8031	**3.0**	10,576
CCCCD	**26,903**	**23,575**	**23,954**	**-11.0**	**36,507**
Total					
CCC	5,679	5,565	4,727	**-16.8**	7,707
DVC	17,282	14,620	14,632	**-15.3**	23,451
LMC	11,670	11,470	11,542	**-1.1**	15,836
CCCCD	**34,631**	**31,655**	**30,901**	**-10.8**	**46,994**

Comments/Analysis:
For each type of Voc. Ed. course, the average of successfully completed courses at each college during the 1999-00 and 2000-01 periods was less than the 1997-98 performance level, with one exception. The colleges will not reach their 2005-06 targets if their current rate of progress continues in each Voc. Ed. area.

1 Based on System Performance on Partnership for Excellence Goals, District and College Baseline Data, Chancellor's Office, California Community Colleges, April 2001.
2 Target figures for 2005-06 based on memorandum from State Chancellor's Office on Local Targets for PFE; these were adjusted as specified in the State Chancellor's Consultation Summary, June 2000.

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SB 645 Follow-Up Assessment of Vocational Education Participants

As mentioned, performance measures gathered to meet the reporting requirements of SB 645 provide follow-up data on students who did and did not complete their Voc. Ed. programs. These findings are presented in this section for three cohort groups—groups of Voc. Ed. program participants who entered in a given year.

Once again, program "completers" are students who completed 12 or more units in a specific vocational discipline or who completed a vocational program, and who had not re-enrolled in the community colleges for one year. Program "completers" were defined as students who received an Associate of Arts or Science degree, as well as those persons receiving a vocational certificate. Program "leavers" were defined as: 1) Persons who completed at least 3 units but less than 12 units of only vocational coursework, considered "skills upgrade" students; 2) Persons who completed at least 12 units in an occupational area, but did not receive a certificate or degree; and 3) Persons who completed occupational programs of less than 18 units. (The Chancellor's Office is implementing changes that will allow representation of certificates awarded in programs of less than 18 units and of noncredit programs in future years.)

Table 39. Demographics of Program Participants

Cohort	Number in Cohort	Est. Median Age of Students	Gender		Ethnicity					
			Female	Male	Amer. Indian	Asian/Pac. Is./Filipino	Black	Hispanic	White	Other Non-White
1995-96										
Completers	796	34	66%	34%	1.5%	19.8%	10.8%	12.1%	55.3%	0.5%
Leavers	701	32	52%	48%	1.2%	16.0%	11.7%	11.6%	58.0%	1.5%
1996-97										
Completers	561	38	70%	30%	0.9%	16.5%	11.9%	11.7%	57.2%	1.8%
Leavers	3,407	42	51%	49%	0.8%	11.5%	9.9%	12.9%	63.7%	1.2%
1997-98										
Completers	480	33	68%	32%	0.8%	20.9%	12.3%	13.8%	51.1%	1.1%
Leavers	3,778	41	54%	46%	1.2%	13.6%	12.1%	11.9%	60.0%	1.2%
County Population:			**51%**	**49%**	**0.4%**	**10.8%**	**9.2%**	**17.7%**	**57.9%**	**0.4%**

* Each demographic statistic is based on records containing related data. Sample size may vary for each attribute assessed.

Comments/Analysis:

Table 39 summarizes select demographic data on three cohort groups. The number of program participants appears to be increasing substantially so. However, over 80% of participants in the 1996-97 and 1997-98 cohort groups did not complete their programs. These Leavers tend to be older than Completers. Further study is needed to identify cause and potential intervention. It is possible that older students leave because they tend to have job skills that are highly valued in the market place and tend to be more employable. Older Leavers would therefore have shorter-term objectives for participating in Voc. Ed. programs (e.g., skill upgrades vs. attainment of an award). There is a higher concentration of female than male amongst Completers and Leavers. A higher percent of Asians complete rather than leave their programs; alternately, Whites tend to leave rather than complete their programs. Amongst Blacks and Hispanics a comparable percent tend to complete or leave their programs. The proportion of minorities participating in Voc. Ed. programs is larger than their representation in the county population.

Source: Office of District Research, Contra Costa CCD. March 2002. Based on data for the California Workforce Investment Board (CALWIB), Performance-Based Accountability (PBA) System. http://calwib.org/pba/pba-ccc.html County statistics based on U.S. Census Bureau, Census 2000 of Population and Housing, Summary File

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Table 40. Ten Most Frequent Occupational Training Programs (1996-97 Community Colleges Cohorts)

Classification of Instruction Program (CIP) Cohorts	COMPLETERS (N=32,187) Percent	LEAVERS (N=98,442) Percent
511601 (v) Nursing (R.N. Training)	11.3	
430103 (v) Criminal Justice/Law Enforcement Administration	10.3	7.7
11010A (v) Computer/Information Science, General		7.8
520101 (v) Business, General	7.8	3.6
520201 (v) Business Administration/Management, General	4.9	
520301 (v) Accounting	4.6	7.1
200201 (v) Child Care/Guidance Workers/Mangers, General	4.1	6.2
470101 (v) Electrical/Electronics Equipment Installer	2.8	
510904 (v) Emergency Medical Tech./Technician	2.8	
520401 (v) Administrative Assistant/Secretarial Science	2.6	4.3
470604 (v) Auto/Automotive Mechanic/Technician	2.1	3.3
110301 (v) Data Processing Tech./Technician		3.0
430201 (v) Fire Protection/Safety Technician		2.9
5210501 (v) Real Estate		2.9
Percent of Total Program Cohort in the Top Ten CIPs:	53.3	48.8

Comments/Analysis:

Statewide, the most popular training programs that students tend to complete are those for nursing, criminal justice/law enforcement administration, and business/general. It should be noted that "leavers" or "skills upgrade" students may have taken 12-18 units. Whether students complete their programs or leave before receiving a certificate or degree, of course, depends on a host of factors, including the availability of attractive job options and the student's need to cover his or her living expenses.

Source: Office of District Research, Contra Costa CCD. March 2002. Based on SB645 data from California Workforce Investment Board (CALWIB) website.

Figure 11. Percent of Program Participants Employed One Year After Attendance

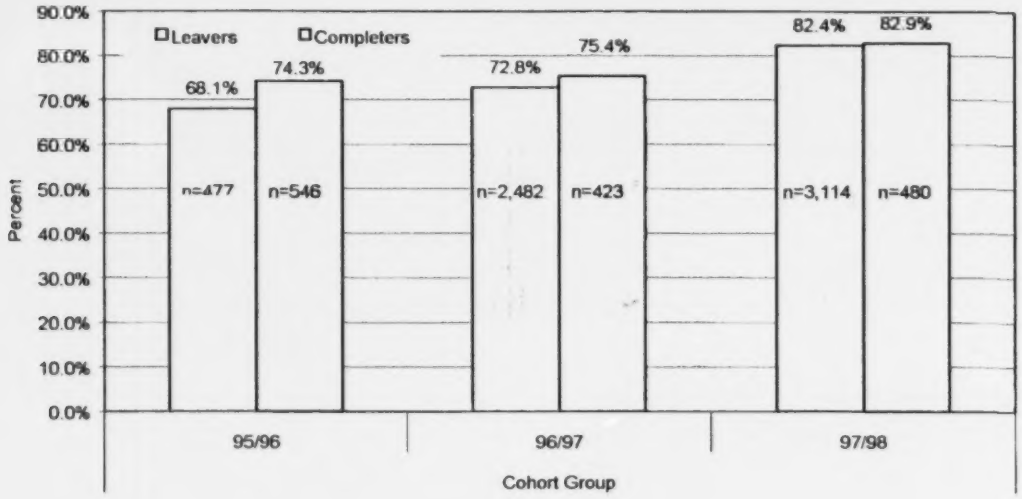
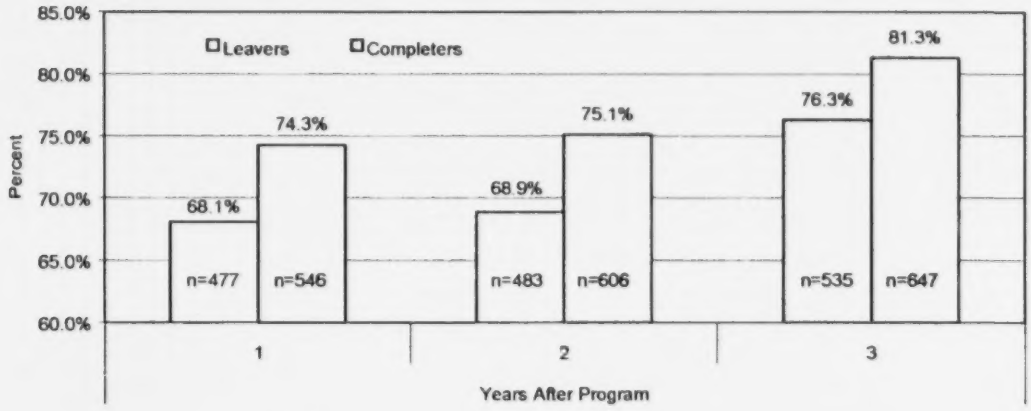


Figure12. Percent of 1995-96 Cohort Group Employed One, Two, Three Years After Attendance



Comments/Analysis: As can be seen in Figure11, the percent of program Leavers and Completers who are employed one year after attendance has come to be comparable. However, the employment rates of the 1995-96 cohort displayed in Figure 12 suggest that with time the value of having completed a Voc. Ed. program becomes more apparent: Completers continue to be employed at a relatively higher rate than Leavers. This may reflect the state's robust economy for the time period assessed, especially towards the end of the 90's. While the employment rates for Completers and Leavers may be comparable during the first year after attendance, the increase in the median earnings of these groups one year after participating in their Voc. Ed. programs is much more pronounced.

Source: Office of District Research, Contra Costa CCD. March 2002. Based on data for the California Workforce Investment Board (CALWIB), Performance-Based Accountability (PBA) System. http://calwib.org/pba/pba-ccc.html

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Figure 13. Median Earnings of Program Completers with Earnings Greater Than or Equal To Annual Minimum Wage Before Participation*

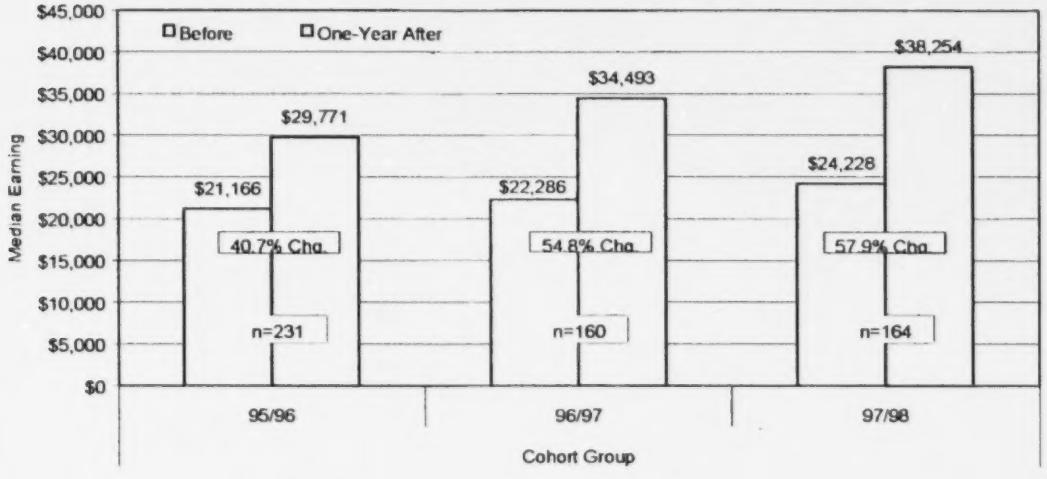
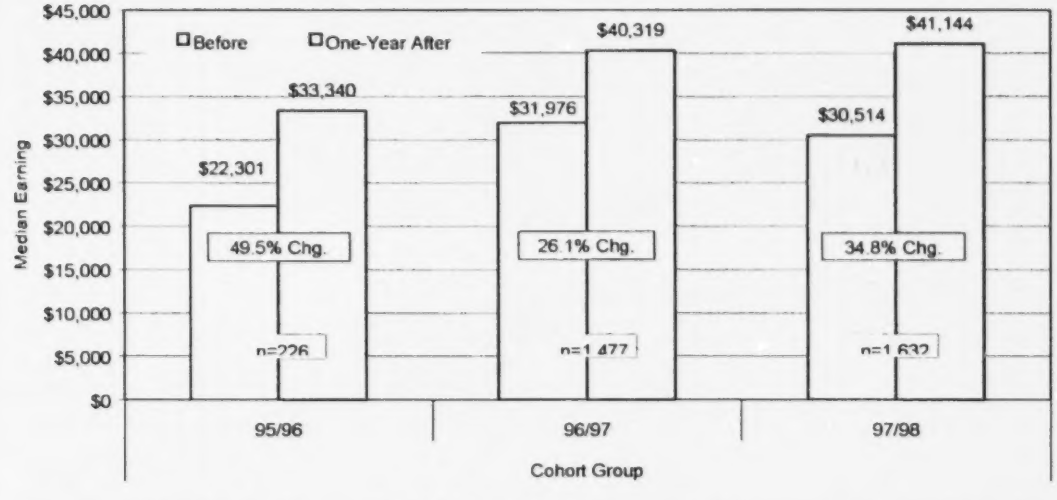


Figure 14. Median Earnings of Program Leavers with Earnings Greater Than or Equal To Annual Minimum Wage Before Participation*



Comments/Analysis: Figures 13 and 14 show that the percent increase in the median salary relative to wages before program participation was generally greater for Completers than Leavers. These findings are even more dramatic for participants who were earning less than the annual minimum wage before enrolling in their Voc. Ed. programs.

Source: Office of District Research, Contra Costa CCD. March 2002. Based on data for the California Workforce Investment Board (CALWIB), Performance-Based Accountability (PBA) System. http://calwib.org/pba/pba-ccc.html

* These data reflect earnings of participants who worked all four quarters after completing their programs.

Figure 15. Median Earnings of Program Completers with Earnings Less Than Annual Minimum Wage Before Participation*

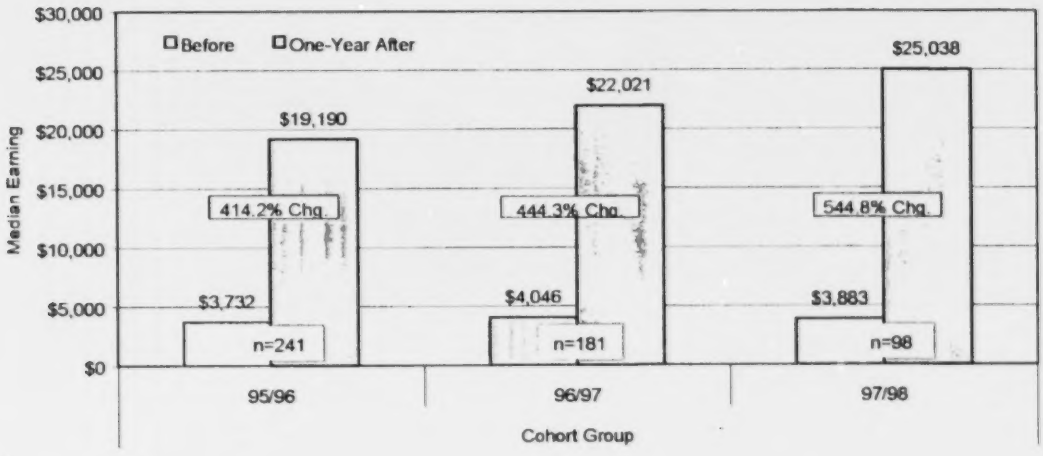
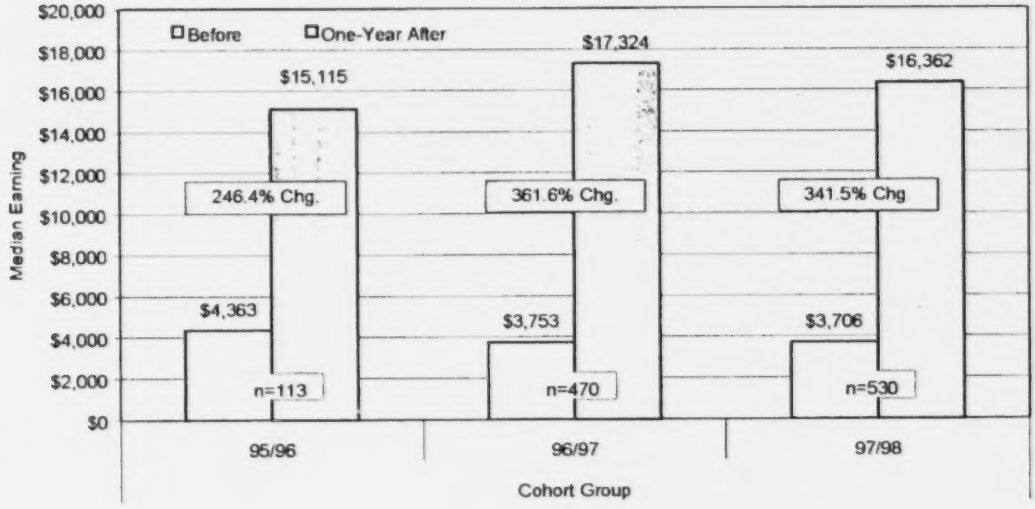


Figure 16. Median Earnings of Program Leavers with Earnings Less Than Annual Minimum Wage Before Participation*



Comments/Analysis: These findings, displayed in Figures 15 and 16 show that both Completers and Leavers benefit from their coursework in terms of their earning capacities and that this is much more the case for the former than the latter.

Source: Office of District Research, Contra Costa CCD. March 2002. Based on data for the California Workforce Investment Board (CALWIB), Performance-Based Accountability (PBA) System. http://calwib.org/pba/pba-ccc.html

* These data reflect earnings of participants who worked all four quarters after completing their programs.

VTEA 2001-02 Core Indicators of Performance

The data reported on in this section comes from the Vocational Education Division of the State Chancellor's Office. There are four "core" indicators that are used by the State to gauge the success of VTEA programs/services as these are implemented across the State's community college districts. The four core indicators are defined as follows:

Core Indicator 1: Academic and Vocational and Technical Skill Proficiencies. The percent of students successfully completing apprenticeship, advanced-level, and introductory vocational education courses.

Core Indicator 2: Completion. The percent of vocational education student "Leavers and Completers" receiving a degree or certificate or transferring to CSU or UC.

Core Indicator 3A: Placement in Postsecondary Education or Employment. Percent of vocational education "Leavers and Completers" found employed during one of the four quarters following the cohort year in California UI covered employment, or a 4-year California public educational institution (CSU or UC).

Core Indicator 3B: Retention in Employment. Percent of vocational education "Leavers and Completers" found employed three or more consecutive quarters during the first four quarters following program exit.

Core Indicator 4A: Participation in Non-Traditional Programs. The percent of students who are members of an under-represented gender participating in vocational education programs leading to nontraditional employment. The numerator for arriving at this percent would be the "number of males in training leading to employment in female dominated occupations plus the number of females in training leading to employment in male dominated occupations." The denominator in this calculation is "the sum of males and females in associated areas."

Core Indicator 4B: Completion of Non-Traditional Programs. The percent of students who are members of an under-represented gender completing vocational education programs leading to nontraditional employment. The numerator for arriving at this percent would be the "number of males in training leading to employment in female dominated occupations plus the number of females in training leading to employment in male dominated occupations who completing vocational education programs." The denominator in this calculation is "the sum of males and females in associated areas."

Tables 41-43 summarizes how well CCC, DVC, and LMC performed in terms of these indicators relative to the standards set by the State Chancellor's Office. The performance of each college is summarized at the 2-digit TOP code level that applies and this performance is referenced to the performance of CCCCD colleges and all reporting California community college districts providing data for the same TOP code area. This analysis can be made at the 4- and 6-digit TOP code levels and for different VTEA student sub-groups. But to keep things manageable, it was decided to keep this analysis at the 2-digit level for all Voc. Ed. students.

It should be kept in mind that above indicators are affected by a myriad of factors which are beyond the control of the colleges, especially Indicators 3 and 4. Once students leave their programs, they often leave the area and the state. Many continue their education or training at institutions other than CSU or UC. Graduates who get employed may be moved out side of the state by their employers or may subsequently fall victim to the ebb and flow of the marketplace.

As can be seen in Table 41, CCC's best performance on said core indicators is in the Business & Management and Public Affairs & Services areas. Alternately, some of its relatively lowest performances are in the Computer & Information Sciences and Engineering & Related Industrial Technology areas. There are some cells, such as those for Core Indicators 2 and 4B, where recorded performances seem unusually low.

As displayed in Table 42, DVC's best performances on the core indicators is in the Architecture & Environmental Design, Business & Management, and Communications areas. Conversely, some of its relatively lowest performances are in the Agricultural & Natural Resources and Consumer Education & Home Economics areas.

Table 43 summarizes LMC's core indicator performances. As can be observed, its best performances were in the Health area. There were several areas in which LMC's performances on most indicators did not exceed the levels set by the state: Computer & Information Science, Engineering & Related Industrial Technology, Consumer Education & Home Economics, and Commercial Services.

The reasons for all these returns are not known. It bears repeating that the patterns of data reported here reflect the cumulative and interactive effects of a wide range of factors. It is not possible to draw tight conclusions from these data "tea leaves." However, a discussion with those most intimate with program services may prove instructive and insightful.

Table 41. VTEA 2001-2002 Core Indicators of Performance by Vocational Top Code
Contra Costa College

Top Code / Area		*Performance Percentage by Two Digit TOP Codes*					
		Core 1 Skill Attainment	Core 2 Completion	Core 3 Placement	Core 3 Retention	Core 4 Completion	Core 4 Participation
02	Architecture & Environmental Design						
	CCC		*50.00*	*100.00*	*100.00*		
	District		80.95	95.24	*100.00*	47.06	
	Systemwide		65.78	82.62	85.44	36.21	31.11
05	Business & Management						
	CCC	86.52	70.97	88.71	85.37	29.55	30.65
	District	72.49	60.55	88.99	78.95	39.90	47.71
	Systemwide	68.12	69.05	85.24	82.99	45.37	48.05
06	Communications						
	CCC	86.21	60.00	90.00	*33.33*		*100.00*
	District	71.01	65.00	90.00	66.67		75.00
	Systemwide	72.47	57.52	84.97	75.20		66.97
07	Computer & Information Science						
	CCC	60.75	52.38	80.95	72.73		
	District	73.98	54.81	83.65	70.59		
	Systemwide	66.44	60.64	82.42	82.74		
09	Engineering & Related Industrial Technology						
	CCC	71.68	22.95	80.33	79.17	7.14	3.64
	District	75.39	28.51	85.11	84.74	12.96	7.80
	Systemwide	77.97	45.20	84.59	84.67	12.05	9.36
10	Fine & Applied Arts						
	CCC	57.14					
	District	59.92					
	Systemwide	71.56					
12	Health						
	CCC	87.29	45.45	88.11	84.35	7.94	9.09
	District	89.36	61.87	91.01	85.34	10.81	10.11
	Systemwide	85.16	86.31	91.64	87.00	13.07	13.28
13	Consumer Education & Home Economics						
	CCC	74.72	41.30	85.87	83.82	27.27	50.00
	District	77.21	36.07	84.26	78.22	43.24	53.85
	Systemwide	76.14	53.51	80.01	81.29	9.63	10.24
21	Public Affairs & Services						
	CCC	74.03	35.71	89.29	86.36	50.00	60.71
	District	92.81	39.05	88.76	85.95	36.73	31.76
	Systemwide	87.08	61.07	89.15	87.53	30.45	28.51
30	Commercial Services						
	CCC	100.00	3.33	60.00	88.89	*100.00*	6.67
	District	90.12	4.62	68.72	79.37	*22.22*	4.10
	Systemwide	80.34	38.94	72.59	74.14	8.96	8.25
XX	Total of All Programs Listed Above						
	CCC	78.69	42.32	84.63	82.73	19.44	19.46
	District	78.72	43.13	85.30	81.23	29.89	27.15
	Systemwide	75.44	61.82	85.24	84.14	26.60	25.86

Legend

Performance Rate Less Than Goal is Shaded	**Total Count 10 or Greater**	***Total Count Less Than 10***

Core 1 – Skill Attainment, Grade C & Above: 76.5% Performance Goal – (1999-2000)

Core 2 – Completions, Certificates, Degrees and Transfers: 59.83% Performance Goal – (1998-99)

Core 3 – Placement 84.86% & Retention 84.24% Performance Goal – (1998-99)

Core 4 – Training Leading to Non-traditional Employment: Greater than 26.47% Participation & 27.68% Completion – (1998-99)

Source: Office of District Research, Contra Costa CCD. March 2002. Based on CCCCO MIS DataBase, EDD Base Wage File, CSU Chancellor's Office, UC Office of the President, 1990 Census.

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Table 42. VTEA 2001-2002 Core Indicators of Performance by Vocational Top Code
Diablo Valley College

Top Code / Area		*Performance Percentage by Two Digit TOP Codes*					
		Core 1 Skill Attainment	Core 2 Completion	Core 3 Placement	Core 3 Retention	Core 4 Completion	Core 4 Participation
01	Agriculture & Natural Resources						
	DVC	**83.51**	**34.78**	**78.26**	**66.67**	*62.50*	**56.52**
	District	**83.51**	**34.78**	**78.26**	**66.67**	*62.50*	**56.52**
	Systemwide	**80.86**	**68.95**	**83.08**	**76.60**	**31.62**	**33.42**
02	Architecture & Environmental Design						
	DVC	**71.89**	**84.21**	**94.74**	*100.00*	**50.00**	**47.37**
	District	**71.89**	**80.95**	**95.24**	*100.00*	**47.06**	**42.71**
	Systemwide	**71.64**	**65.78**	**82.62**	**85.44**	**36.21**	**31.11**
05	Business & Management						
	DVC	**69.17**	**68.00**	**90.67**	**81.58**	**51.96**	**54.67**
	District	**72.49**	**60.55**	**88.99**	**78.95**	**39.90**	**47.71**
	Systemwide	**68.12**	**69.05**	**85.24**	**82.99**	**45.37**	**48.05**
06	Communications						
	DVC	**57.81**	**73.91**	**86.96**	**69.23**	**64.71**	**73.91**
	District	**71.01**	**65.00**	**90.00**	**66.67**	**64.71**	**75.00**
	Systemwide	**72.47**	**57.52**	**84.97**	**75.20**	**59.78**	**66.97**
07	Computer & Information Science						
	DVC	**79.48**	**82.05**	**89.74**	**70.00**		
	District	**73.98**	**54.81**	**83.65**	**70.59**		
	Systemwide	**66.44**	**60.64**	**82.42**	**82.74**		
09	Engineering & Related Industrial Technology						
	DVC	**75.78**	**31.25**	**90.63**	**86.08**	**13.33**	**11.46**
	District	**75.39**	**28.51**	**85.11**	**84.74**	**12.96**	**7.80**
	Systemwide	**77.97**	**45.20**	**84.59**	**84.67**	**12.05**	**9.36**
12	Health						
	DVC	**97.66**	**93.22**	**93.22**	**83.02**		
	District	**89.36**	**61.87**	**91.01**	**85.34**	**10.81**	**10.11**
	Systemwide	**85.16**	**86.31**	**91.64**	**87.00**		**13.28**
13	Consumer Education & Home Economics						
	DVC	**82.24**	**35.15**	**84.85**	**76.03**	**50.00**	**54.43**
	District	**77.21**	**36.07**	**84.26**	**78.22**	**43.24**	**53.85**
	Systemwide	**76.14**	**53.51**	**80.01**	**81.29**	**9.63**	**10.24**
21	Public Affairs & Services						
	DVC	**74.53**	**51.85**	**85.19**	**81.48**	**44.00**	**40.00**
	District	**92.81**	**39.05**	**88.76**	**85.95**	**36.73**	**31.76**
	Systemwide	**87.08**	**61.07**	**89.15**	**87.53**	**30.45**	**28.51**
XX	Total of All Programs Listed Above						
	DVC	**76.78**	**54.96**	**88.24**	**80.00**	**46.88**	**43.83**
	District	**78.58**	**48.00**	**87.35**	**81.25**	**37.89**	**31.76**
	Systemwide	**75.62**	**62.89**	**85.65**	**84.32**	**30.59**	**26.78**

Legend

Performance Rate Less Than Goal is Shaded	**Total Count 10 or Greater**	***Total Count Less Than 10***

Core 1 – Skill Attainment, Grade C & Above: 76.5% Performance Goal – (1999-2000)

Core 2 – Completions, Certificates, Degrees and Transfers: 59.83% Performance Goal – (1998-99)

Core 3 – Placement 84.86% & Retention 84.24% Performance Goal – (1998-99)

Core 4 – Training Leading to Non-traditional Employment: Greater than 26.47% Participation & 27.68% Completion – (1998-99)

Source: Office of District Research, Contra Costa CCD. March 2002. Based on CCCCO MIS DataBase, EDD Base Wage File, CSU Chancellor's Office, UC Office of the President, 1990 Census.

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Table 43. VTEA 2001-2002 Core Indicators of Performance by Vocational Top Code
Los Medanos College

Top Code / Area		*Performance Percentage by Two Digit TOP Codes*					
		Core 1 Skill Attainment	Core 2 Completion	Core 3 Placement	Core 3 Retention	Core 4 Completion	Core 4 Participation
05	Business & Management						
	LMC	69.77	45.22	86.96	73.91	25.00	47.83
	District	72.49	60.55	88.99	78.95	39.90	47.71
	Systemwide	68.12	69.05	85.24	82.99	45.37	48.05
06	Communications						
	LMC	88.24	*42.86*	*100.00*	*100.00*		
	District	71.01	65.00	90.00	66.67		75.00
	Systemwide	72.47	57.52	84.97	75.20		
07	Computer & Information Science						
	LMC	69.57	31.82	79.55	70.00		
	District	73.98	54.81	83.65	70.59		
	Systemwide	66.44	60.64	82.42	82.74		
09	Engineering & Related Industrial Technology						
	LMC	76.08	29.49	82.05	87.30	20.00	5.56
	District	75.39	28.51	85.11	84.74	12.96	7.80
	Systemwide	77.97	45.20	84.59	84.67	12.05	9.36
10	Fine & Applied Arts						
	LMC	60.09	42.86	85.71	71.43	*28.57*	12.50
	District	59.92	42.86	85.71	71.43	*28.57*	12.50
	Systemwide	71.56	55.31	77.58	75.34	28.57	18.18
12	Health						
	LMC	86.63	68.42	94.74	89.06	14.58	13.46
	District	89.36	61.87	91.01	85.34	10.81	10.11
	Systemwide	85.16	86.31	91.64	87.00	13.07	13.28
13	Consumer Education & Home Economics						
	LMC	68.04	29.17	79.17	75.00		*100.00*
	District	77.21	36.07	84.26	78.22		53.85
	Systemwide	76.14	53.51	80.01	81.29		10.24
21	Public Affairs & Services						
	LMC	98.39	23.33	93.33	91.11	14.29	10.00
	District	92.81	39.05	88.76	85.95	36.73	31.76
	Systemwide	87.08	61.07	89.15	87.53	30.45	28.51
30	Commercial Services						
	LMC	88.53	4.85	70.30	77.78	*12.50*	3.64
	District	90.12	4.62	68.72	79.37	*22.22*	4.10
	Systemwide	80.34	38.94	72.59	74.14	8.96	8.25
XX	Total of All Programs Listed Above						
	LMC	81.21	30.78	82.41	80.53	19.42	17.28
	District	78.72	42.65	85.19	81.04	29.04	25.70
	Systemwide	75.44	61.67	85.11	83.99	28.96	25.11

Legend

Performance Rate Less Than Goal is Shaded	Total Count 10 or Greater	*Total Count Less Than 10*

Core 1 – Skill Attainment, Grade C & Above: 76.5% Performance Goal – (1999-2000)

Core 2 – Completions, Certificates, Degrees and Transfers: 59.83% Performance Goal – (1998-99)

Core 3 – Placement 84.86% & Retention 84.24% Performance Goal – (1998-99)

Core 4 – Training Leading to Non-traditional Employment: Greater than 26.47% Participation & 27.68% Completion – (1998-99)

Source: Office of District Research, Contra Costa CCD. March 2002. Based on CCCCO MIS DataBase, EDD Base Wage File, CSU Chancellor's Office, UC Office of the President, 1990 Census.

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Socio-Economic Benefits Generated by CCCCD

A preliminary economic impact study conducted last year by CC Benefits Inc. for CCCCD found evidence for the following estimates:

1. Contra Costa Community College District accounts for $320 million worth of annual earnings in the region, equal to that of roughly 6,500 jobs.

2. Students enjoy a return of 16% on their investment of time and money, higher than the historic return on US stocks and bonds.

3. The State of California benefits from improved health and reduced welfare, unemployment and crime, saving the public some $8.9 million per year.

4. Taxpayers see a return on investments in Contra Costa Community College District of roughly 16% and recover all investments in the first 7.4 years.

These findings support the contention that CCCCD contributes to both the workforce and economic well being of Contra Costa County.

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